GEORGE SMYTTAN DUFF.

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"PIONEERS OF THE PLANTING ENTERPRISE IN CEYLON."

(Second Series.)

GEORGE SMYTTAN DUFF,

BANKER AND PIONEER PROPRIETARY PLANTER.

TIME was when the name of Mr. G. S. Duff was as a "household word" among the Colonists of Ceylon. No more astute nor successful Banker ever came to the East, and no individual capitalist has ever done more right on from the "forties" to develope and sustain the planting enterprise of this Colony. Moreover, Mr. Duff—who is still wonderfully well preserved, although approaching four-score years,—is an evidence of what the tropics may do to prolong a (medically) threatened life and to carry a weak constitution in comfort through early and middle age, until the climate of the United Kingdom—once so inimical—can be faced in safety. There is one case in our experience in Ceylon where a Scottish lawyer condemned by two Doctors as having lungs too far advanced in disease to allow of his living by any possibility, anywhere, beyond two or three years, returned from Ceylon after fifteen years' residence, to his native Highlands to find the two medicos who had signed his death-warrant, both passed away! Mr. Duff's case was not quite parallel, but still striking enough as the sequel will show.

Born and educated in the North of Scotland, Mr. Duff's banking and financial career was early determined on and 1840 found him in a London Banking office; but having a far from robust constitution, the confinement of office hours and the trying fogs of the City soon told, so that towards the end of 1841, he had fairly broken down, his chest and lungs giving ominous signs of being unable to stand another English winter. Fortunately, the young Banker had good friends: his uncle, Dr. Smyttan, had been a College chum of the then Queen's Physician, Sir James Clarke, and the latter came to attend Mr. Duff, bringing him daily throughout November-December 1841, all the news of the young Prince (of Wales) born 9th Nov., Sir James being in attendance on Her Majesty. On comparative recovery, Sir James ordered his youthful patient to leave England at once—he must go to Madeira or the Canaries; but learning he would be quite a stranger there, while he had an uncle (another doctor, Dr. Bell) in Bombay, he gave him permission to go there, although he added that Ceylon as being nearer the equator, would be better. The only difference the Queen's Physician and his patient had was when the latter began to enquire about the needful fee: "If ever your uncle's nephew mentions such a thing, we shall have a serious quarrel" was the generous response.

Accordingly, early in 1842, Mr. G. S. Duff sailed from London for Bombay in the ship "Sophia," Capt. Johns, who had previously belonged to the Indian Navy. Meeting with heavy gales off the Canaries, the ship sustained serious damage, masts and bulwarks being swept away and it was determined to make for Rio de Janeiro to refit. There were 40 lads (mere boys) on board going out for the Indian Navy; but they were kept at the pumps in relays, night and day, and so saved the ship from sinking. After six weeks spent in refitting at Rio, the voyage to Bombay again commenced and Mr. Duff reached that port six months after leaving London. He went to reside with his uncle, Dr. Bell, who had just returned from the Scinde Campaign, having been with Sir Charles Napier in his great defeat of the Amirs at the battle of Meanee. After a time, Mr. Duff's health not improving, the Doctor sent him to Ceylon for a trip. This occupied two months and on his return he entered the Bank of Western India. In August, 1844, however, promotion came: the Manager in Ceylon, Mr. Smollett Campbell, was transferred to China

and as his successor Mr. G. S. Duff arrived from Bombay.

The Western Bank of India, of which Mr. Duff thus became Manager in Ceylon, had only opened in Colombo and Kandy on the 23rd October 1843. It was preceded by "The Bank of Ceylon" in Colombo on 1st June 1841; in Kandy in 1843. The latter Bank became irretrievably involved in the coffee crash of 1847, £60,000 being ultimately lost and the rival institution now changed to the happier title of "The Oriental Bank Corporation," in return for its Royal Charter, took over the liabilities and business of the Bank of Ceylon. In 1851, the two Banks were formally amalgamated, and the "Oriental" entered, in Ceylon, on that long career of unbroken prosperity which it owed in a very special degree to the shrewd and successful management of Mr. G. S. Duff. Colombo became almost the most important, certainly the most prosperous branch of the Bank in the East, and Mr. Duff continued at his post a Manager from 1844 till 1871, with only one interval of 18 months' furlough in England. So long an occupancy of the management of one Branch has been unprecedented in the history of Banking in the East, nor can a career of such uninterrupted prosperity be paralleled.

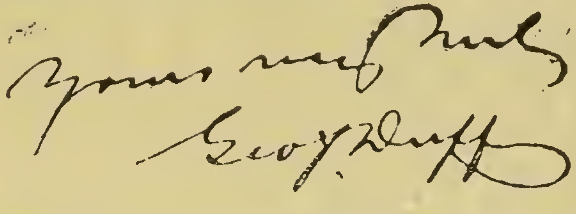
We ought to have chronicled before this, however, a circumstance that contributed very much to Mr. Duff's long residence and good health in Ceylon, namely, his happy marriage in September 1847 to Miss Rodney Brown, daughter of Colonel Brown, who, at the time, Commanded the Royal Engineers in Ceylon. Mrs. Duff's mother was a daughter of thef Hon. John Rodney, Colonial Secretary or Ceylon from 1815 to 1833, and grand-daughte of the famous Admiral Lord Rodney. When as Colonial Secretary Rodney retired from the Ceylon Civil Service, he owned certain land in the neighbourhood of Colombo, which he pointed out, would undoubtedly be valuable to Government as time rolled on and he offered to exchange it for small annuities in favour of his two daughters. This was agreed to; but the bargain proved a hard one for the Colony, since the lady-annuitants were so long-lived that Mrs. Brown (Mrs. Duff's mother) who drew £60 from 1824, only died on 12th February 1897 at Bath aged 93; while her sister, Miss Rodney, still survives and continues to draw from Ceylon, the annuity of £42 also begun in 1824! Mrs. Duff herself, besides being a very handsome, attractive lady—the leader of Society in Colombo for many years next to Queen's House —was always a picture of health, and, humanly speaking, might have been expected to outlive many years her comparatively delicate husband; but her death took place very unexpectedly in London during the summer of 1895. Mr. and Mrs. Duff's family consisted of three sons and three daughters: two of the sons being in the Army as Cavalry officers, the third as a private gentleman residing near Folkestone; while the daughters married, one, Capt. Rolfe, 17th Foot and the other two respectively, Mr. Nevett and Mr. P. C. Oswald whose London firm "Nevett, Oswald, & Co." is intimately connected with Ceylon.

But this is hastening too far; for we have now to treat briefly of Mr. Duff's connection with the planting development of Ceylon, by no means the least important division of his career. Of course, as Banker, he was always the judicious upholder of coffee planting in our hill-country, and most of the profits made for his Bank was through the wise as well as liberal encouragement of the planters and the growing business in all departments that necessarily accompanied the spread of the industry. But personally and in his private capacity, Mr. Duff showed his confidence by investments in coffee. His very first venture was in the Tellisagalla estate, Kotmale, with Mr. Crosby, and he also became interested with relatives in Dumbara, by a purchase, which led to the famous Rajawella litigation case. In the Ballacadua group of estates, Mr. Duff was for some years the partner of Mr. Andrew Nicol; and in conjunction with Mr. J. C. Fowlie he opened Rappahannock estate in Udapussellawa. In Pussellawa and Ramboda he acquired considerable proprietary rights:—Hellebedde which had belonged to the heirs of Colonel Macpherson; while Sanquhar was opened by him, Bluefields and Pallagolla; and Rangbodde purchased from the heirs of General Fraser. In Colombo, Mr. Duff, at one time, owned both Elie House and what is now Mount Lavinia Hotel. On Mr. Lawrence Oliphant selling all the Nuwara Eliya and other Ceylon property belonging to his father, our former Chief Justice Mr. Duff became the purchaser, and from part of the forest land was able to develope Dunsinane estate in the Pundaluoya Valley. When the Messrs. Worms—cousins of the Rothschilds—wished to retire from Ceylon, it was Mr. Duff who arranged the purchase of their properties and so far as this island was concerned, promoted the establishment of "The Ceylon Company, Limited." Then, again, Mr. Duff early became a proprietor and pioneer in the Uva districts. He acquired Gowrakelle, and in partnership with a nephew, the Gonakelle Group as well as Nayabedde in Haputale. Getting alarmed about the dearness of rice and scarcity of labour, Mr. Duff sold the Monsagalla block of land to Mr. C. B. Smith, the same proving, as a coffee plantation, a regular gold mine to the fortunate proprietor. In Haputale, Mr. Duff opened the

large estate of Wiharegalla* having, as his first manager and part proprietor, Mr. F. F. B. Childers (brother of the well-known Orientalist) since settled in business at Monte Carlo. Afterwards, Mr. Duff opened the fine estates of Dunsinane, Pundaluoya district; West Holyrood, Dimbula; and Culloden in Kalutara district—all since sold to Limited Companies. Few capitalists connected with Ceylon suffered more severely through the coffee crisis—the collapse of a great industry owing to the destruction wrought by a fungus enemy of the leaf—than did Mr. Duff; and that not so much in connection with his own properties or personal investments, as through his good nature in becoming security for old friends. In one such case, the loss at a single stroke, to be made good, was no less than £50,000; but Mr. Duff bravely faced the crisis, sold off his property in the Highlands of Scotland, never lost faith in Ceylon and hopefully entered on the new conditions which led to tea gradually but surely superseding coffee, until now he finds his large group of Ceylon plantations more valuable than ever they were. These now comprise a total of 8,525 acres, of which 3,500 are in tea; while 1,500 more acres are in coffee or other products.

It only remains to be mentioned that in August 1865, during the Administration of Sir Hercules Robinson, Mr. Duff was appointed one of the unofficial members of the Legislative Council, a post which he only vacated on leaving the island in 1871.

We have given a very bare outline of a life of great business activity for 27 years in Ceylon—nor did that activity end with Mr. Duff's retirement to England. He still maintained his interest in business, through connection with "the City" Ceylon Companies—such as the Uva and Spring Valley—as well as through his own extensive estates and ever-developing work as pioneer. Mr. Duff also continued to be the friend and supporter—sometimes, as we have shown, to his own great loss—of many in or connected with Ceylon; while as adviser his counsel was sought in many directions. His faith in the Colony has, however, been amply rewarded by the return of prosperity which tea has brought to all its planting country. From his home in Queen's Gate, Kensington, he continues, through the *Overland Observer*, to watch all that goes on in his old adopted home; while, until recent years, he enjoyed his summer residence and shootings in the Highlands, varied by an occasional visit to the Continent, to Egypt or to Ceylon. The great shock of his life came in the summer of 1895 in the unexpected and terribly sudden death of his wife who had always enjoyed good health; but time has enabled Mr. Duff to some degree to overcome the blow and the presence of his daughter and son-in-law (Mr. & Mrs. Oswald) still make his residence "home." When we called to see, and say good-bye to, Mr Duff, during our recent visit to England, we found him in his library finishing a letter—and the caligraphy of the old gentleman, well on towards 80 years, is as admirably clear and neat with its plain but all-sufficing signature



as was that of the Colombo Banker of the "sixties." "In a minute I'll be free," was Mr, Duff's remark as he rapidly completed his letter. rose to a copying press in the corner of the room, secured the duplicate, returned to his seat and laid aside the half-dozen letters he had prepared for the post. "Two or three hours of such work in here daily, keep me alive," was his remark and he then readily entered into reminiscences of early days in Ceylon, imparting confidences, in answer to stray questions, to which we have scarcely ventured to refer in our scanty notice. For, to write adequately of Mr. and Mrs. Duff's life in Ceylon would be to give not only the financial, business and planting, but also the social history of the Colony during one of its most interesting and progressive periods. There were few love matches or marriages of any note among the Colonists of the "fifties" or "sixties" in Ceylon, in which the influential Banker and his hospitable warmhearted wife did not bear a generous part and not a few happy unions, indeed, for which they were very much responsible. That is all of the past; but it is a matter of present and continuous interest that the name of "G. S. Duff" should continue even now as proprietor (individually or in partnership) of such important and widely separated plantations in the island as the following:--

Name	District	Area-acres: Total	—cultivated
Helbodde	.. Pussellawa	.. 1,778	.. 735
Rangbodde	.. Ramboda	.. 2,081	.. 922
Wiharegalla	.. Haputale	.. 8,95¼	.. 7,99½
Nayabedde	.. ,,	.. 1,125	.. 867
Gonakelle Group	.. Passara	1,752	.. 995
Gowrakelle	.. Badulla	.. 829	.. 635
Kitulgala	.. Dolasbage	.. 65	.. 50
	Total..	8,525	5,003

Long may Mr. GEORGE SMYTTAN DUFF be spared as a typical successful Ceylon Colonist—a model of industry, uprightness and shrewdness as Banker; of enterprise, liberality and confidence as pioneer proprietary planter.

* On one of Mr. Duff's visits to Ceylon—in this property was privately declared for sale and the late Mr. C. H. De Soysa offered £80,000 for it. Mr. Duff held out for £85,000; but after he left the island, he changed his mind and telegraphed from Aden to his Agents to sell to Mr. De Soysa. The answer to his continental address was "Too late: Mr. De Soysa has gone in for something else." No loss to Mr. Duff, since Wiharegalla after that year yielded profits aggregating fully the above price, and now in tea is as valuable perhaps as ever it was.

Agricultural Pests :

WITH METHODS OF PREVENTION.

BY MISS E. A. ORMEROD
(LATE CONSULTING ENTOMOLOGIST TO THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND).

IV.

BEETLES AND WEEVILS INJURIOUS TO FIELD CROPS AND GARDENS.

The Apple-blossom weevil (*Anthonomus pomorum*) does much harm by laying its eggs in unopened apple-buds, where the maggot feeds, and thus destroys the young forming fruit. This weevil shelters itself during winter under clods of earth and rubbish, and also beneath rough bark on the tree (so that keeping rough ground and bark in order serves much to diminish their numbers); but further, it comes out in the spring, and the females, it is stated, rarely fly, but crawl on the branches, and drop down on being alarmed. By working on this habit of the apple-blossom weevil (and of some other kinds), we may clear many sorts of fruit trees and bush fruit simply by jarring the boughs. Thus the weevil falls, and we only need to use such plans as common sense will teach us, to keep it from getting back again. With the apple weevil, or those that are shaken down from the trees, such methods as putting a rough rope, or a ring of anything they will not cross on the ground, round the trunk, answer well. This may be made of twisted hay (or anything preferred), which has been dipped in spirits of tar, or in tar and coarse oil, so that it may keep wet and sticky or caustic gas-lime may be shovelled round, of course taking care not to hurt the bark.

In Cornwall, where the pitchy-legged Weevils, or other kinds of *Otiorhynchus*, injure the fruit to an extent causing serious loss in the great raspberry gardens, it is found to answer, well for men to go round with freshy tarred boards, place the boards below a bush and shake; the weevils fall on the tar and stick to it. Thus, clearing the weevils and retarring the boards frequently, the weevils are got rid of at a paying rate.

The principle of alarming the weevils, so as to make them fall, may be applied to many kinds of weevil attack, bearing in mind that the weevils commonly fall on the first alarm; and we must give a little attention to their habits, or they may all have dropped down and secured themselves before he have set about frightening them in full form.

Several kinds of weevils feed on peas, beans, and clover leaves, doing thereby most serious harm.

The terribly destructive pea weevils were formerly supposed to feed only by day; then they fall at the vibration of a foot, and bury themselves. There may have been hundreds a minute before, but you will very likely not see one; but beat the ground with a spade and you will most likely see them all struggling up out of the earth again. More recently, however, observations have shown that they may be found at night working at the edges of the leaves, and then it is stated they are not nearly so susceptible of alarm.

Returning now to the ravages of the *Sitones*, commonly known as "pea and bean weevils," these may be told by the semi-circular scoops eaten out of the leaves. We find these attacks the worst to the leafage of young plants, especially when, from weather or other circumstances, the plant is kept back, so that it cannot grow away from them; but the weevils are to be found in legions later in the year, and sweeping these up, as they are to be found in the waggons when clover or peas are being carried, would get rid of some amount of coming attack. The main point we seem to need here is to prevent the settlement of the autumn brood of beetles. These fly well, and have been found to shelter themselves in the top joint of corn stubble, and from this they come out to set on foot attack in *Trifolium*, or clover, drilled after. Also it has been noticed that where wheat-sheaves stood long in havest-time, the clover on these spots was free from attack in the following spring, although that on the rest of the field was attacked. Acting on these observations, skimming the surface stubble, so as to get rid of the shelter, has been considered useful; and a good liming, or other chemical dressing, much of which would go into the stubble and make it a very undesirable home for the weevil, would help us. All measures which will push on good growth are valuable preventives in this case; and in gardens it would probably do a deal of good, to lay the drawn and useless haulm along the rows, with any dry rubbish, and burn it. It appears to be the nature of this weevil to come up not to go down, on alarm; and we might thus clear out the parents of the next spring's attack.

The small long-snouted "pear-shaped" clover weevil also does much harm to clover leafage; but in this case the grub lives in the seed-head, and seeds on the young forming seed; and the best known method of prevention is cutting the clover before the flower is fully out. These pear-shaped weevils are so very small that they are hardly observable, but the damage to the leafage, or patches of brownish heads in a field in flower, shows where they are at work.

There is yet one more of the common weevil attack of the bean crops to notice; it is that of a small short-snouted weevil (black with brown hairs and white markings), which is often found inside broad beans, with no signs outside of how it got there. The attack happens thus:—When the bean-pod is still in its very youngest state, even still in the blossom, the beetle lays its egg there; the maggot, which hatches from it, lies in one of the young beans in the pod, but the hole by which the egg was put in, or maggot crept in, is so small that it grows up completely with the growth of the bean. When the beans are ripe and garnered, the maggot is there too. It feeds within; and though it does not prevent the bean sprouting, yet it lessens the size of the seed-leaves, and consequently weakens the first growth, and thus damages the strength of the future plant. Here one good method of prevention is to examine a sample seed, to find whether it is infested. The maggot turns to a beetle within the seed; but before it does this it eats a tunnel to the outside, only just leaving the outer skin at the end. This, having nothing behind it sinks in, as if a knitting-needle had been slightly pressed on it. By this little round dented-in mark you may know infested seed; if, instead of the mark, there is a small round hole, the beetle has completed its work within, and has gone. By these two marks you may judge as to the state of the seed; and, further, if there should be the mark showing the beetle is still within, it is unsafe to sow as attack will follow. The beetles will presently come out, and as soon as the beans in which they were sown have grown, and are in flower, their sometime tenants will mount to the blossoms, and lay eggs to start a new attack. The bean beetles begin to appear in February, and for this reason autumn-sown beans are the most likely to be infested as the beetles are still within.

During the last few years it has been found that dressing infested beans, before sowing, with a mixture of 1 lb. blue vitriol, and 1 pint of McDougall's sewage carbolic to 6 quarts of water, answered well. The above mixture is enough for six bushels of beans.

The cabbage and turnip gall weevils do harm underground. The female lays her egg on the root or the under-ground part of the stem, or in a hole which she forms with her snout; and in consequence of the irritation thus set up the small lumps form, which we know as galls. In each of those the maggot hatched from the egg feeds, until it is full fed. Then it gnaws its way out and forms an earthen case, in which it turns to a pupa, and thence to a weevil.

The maggot does not care for cold. It will mend its earthen case if it is broken; and even if it is buried by the galls on the cabbage stalks being dug in, it appears to thrive as well as if they were still growing. Therefore, it is a great object to get rid of all nurseries of future attack by burning or otherwise destroying old stems with galls, instead of throwing them to a rubbish-heap or digging them in; and a change of crop is useful, by presenting food that they cannot eat, or find useful to lay eggs in, to the gall weevils that may be waiting in the ground.

In many of the weevil attacks which we have been studying, treatment of the surface of the ground is a great point; as, for instance, where they shelter under rubbish, or down stubble, to clear away these shelters, and put on dressings which will be thoroughly obnoxious to the weevils, is good treatment. Where the weevils, or their grubs, are in the ground, it obviously is well to turn them out on the surface, or bury them by trenching so deeply that they cannot come up; and also, so to dig in, or otherwise apply, chemical manures, as to make the soil unpleasant at least to the pest, and so good for the plant that it may grow away from attack.

The turnip flea beetles are well known for their leaping powers. They live during winter under clods, or in dry stone walls, or any convenient shelter and come out with sunshine in spring. Then they feed on any plant of the cabbage kind; charlock is an especial favourite, until the young turnip plants are come up. Presently they lay their eggs (if on turnips) on the under side of the rough leaf, and from these the grub eats its way into the leaf, within which it feeds for about six days. It then comes out, buries itself in the ground, and turns to the chrysalis, from which the beetle appears in about a fortnight, ready to begin a new attack.

The first point in prevention is to take care there is as little winter shelter as possible. Lumps of manure and clods of earth on the field; heaps of stones and rubbish, such as are often allowed to lie in corners of fields; large collections of dead leaves on the borders of woods; and dry dykes or open stone walls—are all winter shelters.

Another point is to let there be as few weeds as possible to keep the "Fly" alive. If it does not find suitable food it will die or remove itself. It has a power of perceiving where its food is; and such plants as charlock, or the white-flowering Jack-by-the-edge, or shepherd's purse, will all help to keep it alive till our turnips are ready. Thus, we may lessen the amount of coming attack; but the great point to depend on for carrying the turnip crop through "fly" attack is judicious preparation of the ground—plentiful supply of enrichment, including a good amount of artificial manure, and liberal supply of seed.

The "fly" does most harm to the turnips whilst they are still in the seed-leaves; therefore, all means should be used to give a good start, and run the plant on in a hearty growth. For this purpose the land should be well prepared beforehand. Where climate allows, autumn cultivation is best. Thus the surface soil is broken down by the winter frosts, and there is a good tilth on the surface, with absence of the clods which shelter "fly" and cause a dry top, instead of the evenly-evaporating surface which suits the young turnips. When thus cultivated beforehand, the land does not require ploughing again in spring; scarifying is enough; and thus the supplies of moisture which have gathered below the surface during the winter remain undisturbed; whereas, if the ploughs are put in, the soil is turned up to a much greater depth, and instead of a mellowed surface with good moisture below, we part with the stores which in a dry season, would have made all the difference of life or death to the crop. The turnip plant is of such a succulent nature, that the point of supplying it with enough moisture is one of the main things in all methods of starting it.

It is advised to let the land remain untouched for a few days before drilling, with a view to the surface not being dried by exposure just before sowing; and the effect of what seems just the opposite treatment—namely, to sow at once, when partly rotted manure is ploughed in, in spring—is, for the same reason, to secure the moisture. But whenever it may be necessary to work the land, one great point is to secure such a state of under-soil and upper-tilth as will push the plant on; and by no means trust to a mere good tilth, if it is gained, as is sometimes done, by turning the land over in the sunshine and heat until we fairly see the dust rising, and, as it has been well remarked, it is as dry as if we were making hay. Turnip fly delights in heat and drought, and the turnips in just the opposite.

Liberal seeding—3lbs. or more per acre, answers well; for if fly comes there is a good chance of some of the plants escaping, and if it does not the surplus quantity may easily by removed. In either case the large number of plants helps towards a hearty start, as the many small leaves prevent the moisture beneath evaporating, as it would from bare earth, and thus keep a damp air beneath the leaves. Good seed is also very important, so that it may sprout at once, and with vigour.

To gain this hearty and rapid growth through the time of the seed-leaves is one of the reasons of applying artificial manure before sowing, or drilling it together with the seed. A few hundredweights of superphosphate, or other manure suitable to the land, even if there is a good supply of farm manure also, will run the plant on rapidly through the growth of the seed-leaves; and when the rough leaves are come the greatest danger is past.

Where a crop hangs back, the water-cart has been found useful, and also the putting in of the seed with the water-drill; but if the weather should be dry at the time of sowing, there is fear of the small supply of moisture put in by the water-drill causing harm (by the mere temporary effect) rather than permanent growth.

When attack is present, various fertilisers have been found to do good by pushing the plant on; but all applications intending to serve by removing "fly," or killing it, should be used either when the dew is on at night or early morning, or during damp by day.

The turnip fly leaps away when it finds attack coming; but if the dew or slight rain is on it, it cannot leap, because the moisture clogs the hind legs, by means of which it takes its great springs. Therefore, such measures as driving sheep through infested fields, or laying on special dressings, often fail, because they have been done at time when the fly is well able to avoid receiving harm. Turnip fly attack is one of those that it would be well to enter on, if possible, in full detail, as an instance of those which only last for a short time, and which we conquer by methods having, for the most part, very little to do with the insect itself. We know that the turnip is chiefly in danger whilst in the seed-leaves; we know exactly what will suit its growth in this state, and we make ready the ground accordingly; also we clear away weeds which would support the "fly" when the crops are not present for it to feed on.

PROGRESS IN THE PERAK STATE.

In the few remarks which I intend to make on this subject I do not purpose to trouble your readers with satistics, or to say much about the "pig that pays the rint"—the tin mining industry—though up to the present it has run the whole show.

ROADS AND RAILWAYS.

Communications everywhere are the wheels of progress; if they are bad the wheels go slowly round; and if they are good, better, best, the pace is proportionate. At present it may be said that communications in Perak are "good"—that is there is a first-class metalled road from Taiping, where the railway from Port Weld lands you, to Kuala Kangsar on the Perak River, a distance of 23 miles; and from the latter place there is a branch road of 20 miles to Kota Tampan towards Norsh Perak. The continuation of the K. K. road across the Perak River takes you into Kinta, the prin-

cipal tin producing province (exporting something like 120,000 cwts. annually), where you meet the Kinta Valley Railway at Cheemor, 22 miles from K. K. and 65 miles from Telok Anson—the present outlet of Kinta and Lower Perak on the Straits of Malacca. To take you to the Southern border of Perak and the Northern of Selangor at Tanjong Malim, some 50 miles from Tapah on the K. V. Railway, there is only a bridle-road and indifferent bridges. Such is the state of existing communications, which, taken as a whole, may be called "good". We will say nothing about the steamers which carry you from Penang to Port Weld and Telok Anson, because they belong to a private firm and are not subsidised. If they were, perhaps they would be more comfortable and the Government of Perak might see more visitors, and secure some of them as investors in the land which is so abundant.

METRE GAUGE RAILWAYS EVERYWHERE.

There is, however, a near prospect of the qualification "good" being converted into "better" as 20 miles of the break between Larut and Kinta in railway communication are under construction, and 25 miles under survey. Between Taiping and Prai, opposite Penang, at about 50 miles' distance, the railway survey is in progress, as it is between Tapah and Tanjong Malim, another 50 miles. The completion of this through line of railway communication in Perak may be looked for before the year 1900 is ended, for they don't take up years of time there in talking about their proposed lines and they don't worry themselves over gauge. They have adopted the metre, and they are content to keep it to the end, as the best suited in cost and capacity for a country of short distances, though with a large traffic in the present, and a still larger in prospect the near future.

What the speedy completion of this "better"—I may say "best' line of communication when Selangor, with 16 miles, links up from Kuala Kubu —may be judged from the small "boom" that set in a year ago in coffee planting, cosequent, in a measure, on the steadily-pursued railway policy of the Government of going ahead until their trunk line is an accomplished fact.

THE LABOUR AND ADVANCES ROBBERS.

Prior to the last year or two you could not point to any considerable evidences of the doings of coffee beyond Waterloo (Arabian) and Kamuning estate (Liberian), both the result of European capital and enterprise. Now you can point to recent development of about a thousand acres in coffee in the Kuala Kangsar, and a great deal more in the Kinta district; and a feature in this fresh departure is the investment of Chinese capital. Whichever way it is, from a belief in coffee or a disbelief in mining, the fact remains that the Chinaman is putting his money into coffee, and, when he joins with the European in the race, we can come to no other conclusion than that, for better or worse, there is to be a run on the coffee lands of the Perak State. That it will be for the better all the evidences go to shew; where it may be for the worse I am inclined to say it will be from faults that could be avoided, and not from any drawbacks of soil, climate, labour, or communications. This leads me to speak of the labour problem in Perak. Until within a recent period it was a difficult problem and a deterrent to planting progress, I think it is not so any longer. The Chinese are as apt at most of the planting work as the Tamils, and will do it as cheaply and well. Both these races can now be got in sufficient numbers and without advances, and, so long as tin is at its present price, there need be no fear as regards labour, even should the "boom" to which I have referred extend in volume and make a larger demand than hitherto on the labour supply. We in Perak are, of course, at a disadvantage compared with Ceylon as regards rate of wages, but we have, on the other hand, the advantage in freedom from advances and necessity of supplying rice The cooly gets his pay every month regularly, and all that has to be done for him is to provide good lines and give him medicine when necessary; his rice and fish he gets as cheap as in Ceylon, and such things as plantains he gets for nothing or next to it. With all these inducements to the cooly I dont think the planter in Perak has anything to fear as regards labour any more than he has with regard to the good growth and plentiful cropping of Liberian. I see nothing else to fear that the market, which may become glutted with coffee as it is sometimes in danger of being with tea. Sir Græme Elphinstone last year cleared 500 acres of land, which he planted mostly with Liberian Coffee, and at the beginning of this year he had next to nothing on his books in outstanding advances. I believe this experience of one, which I quote, is the experience of the many in Perak. If it were not so there would not be the advance there has recently been for Chinese would not hang on to a place under advances the same as the Tamils in Ceylon, any more than the Tamils in Perak would do; and there would be much greater loss in recovery, as I had good cause to know in connection with railway work there.

THE TAMILS IN PERAK.

Additional and cheapened facilities in the steamboat communication between Penang or the Straits and Southern India, coupled, with the increasing popularity of Perak with the India coolie, will bring Tamil free labour over in greater numbers year by year, and the planter there will before long have the advantage of two races competing for his work; and he can look forward to getting more work out of the individual than hitherto. That this will be a blessing to the coolie himself there cannot be a doubt, for it was the short hours and high pay that tended to demoralize the Perak Tamil and make him so inferior in quantity and quality of work to his brother in Ceylon.

YIELD OF LIBERIAN COFFEE.

As already mentioned' coffee planting in Perak is so much in its infancy that not much can be looked for, so far, in crop results, but what can be mentioned of the yield in 1895 of clean coffee from one estate having 257 acres more or less in full bearing, 6 to 7 years old, is encouraging enough for those later in the field. The acreage mentioned, with something like 400 trees to the acre of Liberian, some of it topped at 6 feet, and some at 10 and 12 feet, gave 6½ cwts. per acre of clean berry, which fetched the highest price in the Singapore market. This result was attained without the aid of any manure; with that aid it is quite likely the crop return might have been increased by fifty per cent.

COCONUTS.

Regarding coconuts I am inclined to think that on a large scale the returns will be much greater than in Ceylon. Going into a native garden where there were some very fine trees, I asked how many nuts were got from a tree in a year, and was told 200. This may be right or wrong, but there is no doubt of the heavy bearing capacities of the trees generally,

I say nothing about Selangor, for I have not been their this time, neither do I say anything about planting Liberian, in imitation of Selangor, on the low, flat, more or less swampy, peaty lands by the sea, for time will tell if the venture be right or wrong.—Local "Times."

THE WOODS OF SAMOA.

Much has been written about Samoan woods, their beauty, abundance, and variety, but, says the United States Consul-General at Apia, there is but little foundation for the statement that these woods are likely to become a source of marvellous wealth. There can be no question but that the variety of woods is very extensive, and that a limited pro-

portion may in time become valuable. Most of the Samoan woods are very soft and light, which aftes becoming well dried, lose not only a great proportion of weight, but become brittle, and of no practical worth to sustain lateral strain. In addition to these, there are several varieties of hard woods, such as the *ifelele, talia, pau, toi, nisla, tau*, and the *ifi (Inocarpus edulis)*, which can scarcely be said to be abundant. Several of these are beautiful, very hard, and susceptible of a high polish. One or two varieties grow to a fine size, and are in request among the natives for making kava bowls—wide shallow vessels, hollowed out from cross sections of the butt of the tree, generally from 18 inches to 2 feet in diameter, and some times reaching 3 ft. 6 in. iu width. Woods employed for this purpose would doubtless cut into veneers, were there a demand for their peculiar colour and grain by the fancies of fashion. Such, however, docs not at present exist, and there is uo probability that the mere eccentricty of taste will take a direction to create a demaud. A large amouut of hard wood is used in makiug the eommon canoe of the natives. These are mere logs, hollowed out, and the largest with rare exceptions, would not require a log of more than two or three feet in diameter. These canoes are hollowed laboriously out of the log, on the ground where the tree is felled, being hewn away until the boat is a mere shell of from 1 to 1½ iuches in thicknecs, except at the bow and stern. When thus lightened to a minimum, they are dragged and carried to tho water. While large trees are numerons, they are not iu proportion to the extent covered by the forest, or to that common in a country of merchantable timber, plentiful, or found close together. The deuse character of the tropic, forest, the deep shade, moisture, and heat, has naturally, in such a climate, the influence of so thickly crowding the surface with shoots and young trees, that the forest is a mass of slender saplings, overcrowded and dense, all under the stimulus of the need of light aud air, towering to reach the open space above. In such a bush, the large trees having attained size on some principles of survival of the fittest, abound in necessarily limited abundance. These large trees, of nearly all varieties, flare out at the butt in ribs or inverted brackets nutil they cover a space at the surface of from 12 to even 20 feet. The woods are not of straight grain, but are twisted, knotted, gnarled, and contorted in shape, and this bent and knotted quality in the hard and tough varieties produces a most excellent material for knees in small and medium-sized wooden vessels, for which it is much used. In a general sense, it is, perhaps, in this employment that Samoan woods fiud their greatest value. Much was expected in years gone by from the production of fibres, and an array of plants was cited producing fibres of a merchantable character. The intervening years have allowed the shipments of various samples to Europe for experiment, but the experiments were such that no encouragement or demand followed. The fibre obtained from the covering of the coco-nut is particularly the ouly one produce in the Samoan islands. This article is well-known to commerce, and long ago took a place in the manufacture of mats, and to some extent as a substitute for hemp in twines. In all coconut growing countries, it is of course abundant in proportion to the production of mats. In Samoa it is used by the natives iu making all the twiue and small rope their needs require, and does not euter into export—*Journal of the Society of Arts.*

HASSAN JACK FRUIT.

The Jack-tree of the East Iudies (Artoearpus integrifolia) is a handsome evergreen tree about 60 feet high, the truuk having a diameter of 30 to 40 inches. Its dome of dark foliage, with the stem burdened with monster fruits, is perhaps one of the most characteristic features of East Indian village surroundings. The yellow timber is highly valued for carpentry and furniture, and takes a fine polish; it becomes beautifully mottled with time, and then resembles Mahogany. It also yields a yellow dye, little inferior to fustic. The fruit yields a very important artiele of food to the natives of the East Indies, both when green as well as wheu ripe. It is closely allied to the Bread-fruit of the Pacific Islands, but usually is not so palatable. Europeans seldom touch it. The oily seeds, when roasted, are eaten, and are said to resmble Chestnuts.

The leaves of the Jack-tree, as the specific name implies, are usually entire. In exceptional cases they are three-lobed; this is specially a characteristic of seedling plants. The lobing of the leaves shows the affinity of the Jack to the Bread-fruit. They both belong to the tribe Artocarpeæ of the N. O. Urticaceæ, as also do the Figs, which yield a similar milky juice. The flowers of the jack, produce on the stem and older branches, are monœcious—that is, they apper on different parts of the same plant They have a somewhat sweet smell. This is in marked coutrast to the strong, unpleasaut odour of the ripe fruit. The male flowers are densely crowded on the outside of a fleshy horn-like central receptacle, about 2 to 3 inches long. The individual flowers are very minute, and consist of a single stamen and a two-lobed yellow auther. In a section across the receptacle the male flowers are to be seen radiating in a very regular manuer from the circumference of the spongy centre. The female flowers are similarly arranged, but on a much larger receptacle, and are so numerous and thickly crowded as to form an oblong, tuberculated mass of flowers several inches long. Each female flower consists of an oblong, tubular perianth, greeu and contracted at the mouth. The ovary is provided at the base with a lateral white style passing through the aperture of the perianth. After the ovary is fertilised the mass (or spadix as it might be called) swells in all directions, and forms a tuberculated, compound fleshy fruit, sometimes weighing from 40 to 60 lbs., probably the largest that is known. The central part is the soft, fleshy receptacle; surrounding this, aud radiating toward the circumference, are—(1) the succulent parts of the very numerous, linear, abortive florets; aud (2) the enlarged perianths of the fertile florets much swollen, and appeariug as brownish-yellow succulent masses, 2 or 3 inches long. These two sets of bodies coustitute the eatable part of the Jack-fruit. Each seed is completely burried in pulp, and enclosed in a leathery testa. It is usually as large as a Nutmeg; it is destitute of albumen, and composed of two unequal cotyledons.

Good figures of the flowers and fruit are given in the *Botanical Magazine*, tt. 2833 and 2834, from speeimens grown in the Botanic Garden at St. Vincent, in the West Indies. A plant is mentioned to have flowered in 1827 in the stove of the Edinburgh Botanic Garden.

The ordinary Jack-fruit above described is familiar in many parts of the tropics, and is widely cultivated in the East, from the Punjab to China, aud from the Himalaya to the Moluccas. There are numerous varieties recognised by the natives of Iudia and Ceylon. Although eommon in the latter country, it has probably been introduced at a remote period from India. It was iutroduced to Jamaica and St. Vincent by Admiral Rodney in 1782, and thenee distributed to other eountries in tropical Ameriea. The fruit is not esteemed anywhere in the New World; probably the single variety there known is an inferior one.

This year a drawing of a very remarkable Jackfruit was sent to me by Mr. J. Cameron, F.L.S., Superintendent of the Lal Bagh Gardens, Bangalore, in Mysore. Iu a letter dated August 29 last he gave the following description of it:—

"About a month ago I sent you a photograph and a water-colour drawing of a remarkable Jack-fruit—

at least remarkable to me, as it is the first of its kind I have ever seen.... The fruit and photograph were sent to me from Hassam, one of our hill districts by Mr. A. Watkinson, a coffee planter. His own letters, with two of my replies enclosed, will afford all the information at my disposal. Would you do me the great favour to say what you think of this fruit?.... With your eastern and western experiences you are, of course, well acquainted with the usual form of this fruit, and can offer a valuable opinion."

Mr Watkinson's account of the tree is as follows:—"There is a peculiar Jack-tree here, the shell which holds the kernel grows on the outside of the fruit ... Both planters and natives declare it to be unknown in any other part of the district. The native idea is, it was brought hither by a cobra when young!!" On March 23, 1896, Mr. Watkinson sent a specimen of the fruit to Mr. Cameron with the following note: "In October last I wrote you about a curious Jack-fruit, a specimen of which I am sending by bearer. I think you will find that the pericarp is intermixed with the tubercles or spines, and that the peculiarity is not caused by enlarged spines. I am sending a fruit weighing 9½ lb. to Mr. Graham Anderson. I should have sent the larger one to you, but it is already over-ripe, and should be in a state of decomposition by the time it reached you...I could send you another later on, as there are five others on the tree only half-grown." Mr. Watkinson adds, "I can see no difference in the tree itself from the rest of the trees of the wild Jack." The wood-cut (fig. 125) represents the Hassam Jack-fruit one-half the natural size. Its most striking characteristic is the position of the seeds on the outside, instead of being buried, as usual, in copious pulp. There is evidently no swelling either of the receptacle or of the perianth, as in the ordinary Jack-fruit. Hence the Hassam fruit is probably uneatable. The spine-like processes occupying the area between the seeds are the abortive florets.

Sir Joseph Hooker, who has recently completed his great work, *The Flora of British India*, has been good enough to examine the drawing of the Hassan-fruit, and he is of opinion that it is either an abnormal form, or a new species.

Colonel Beddome, F.L.S., who is credited with having found the Jack-tree in a wild state in Southern India, expresses a similar opinion in the following words:—

"The Jack-tree is very common in a wild state in all the moist forests on the western ghâts of the Madras presidency.... Its fruit does not differ from that of the cultivated tree. Your drawing must, I think, represent a quite abnormal form, unless it be a new species. I can only say I never saw anything like it."

Apparently it is not an abnormal form, as the seeds (I learn from Mr. Cameron) are fully developed, and give rise to normally healthy plants. These are now growing in the Bangalore Garden. The matter cannot be carried any further at present, but material is promised of both the leaves and of flowers, the latter in different stages of development. When these arrive it may be possible to come at a more definite conclusion respecting this interesting plant.—D. Morris, *Kew, December 5.—Gardeners' Chronicle.*

THE COFFEE ENTERPRISE IN SELANGOR.

Judging from the enthusiasm of those directly interested in the cultivation of Liberian coffee in Selangor (writes a correspondent who has been visiting the Native States of the Malay Archipelago) there seems to be a great future in store for the enterprise. In Ceylon you have heard from one source or another, at irregular intervals of the opportunities offered by investments in land in these States, but very little real interest seems to have been taken in the matter. I have had the privilege of meeting amongst others, Mr. Toynbee, who was engaged in opening out the first estate ever put under cultivation in Selangor, and who naturally is an authority on the subject. He is now one of the largest proprietors in the district. Selangor is the capital of the newly-organized Federated States of which Mr. F. A. Swettenham, C.M.G., is the Resident-General. It is, in extent, 3,000 square miles, or about one-eighth of the size of Ceylon. It lies immediately to the South of Perak, and is well intersected with railways. The climate is much the same as that of Colombo and the lowcountry of Ceylon, and is regarded as being no less healthy than the average Eastern country.

At present there are some sixty estates under cultivation, but many more are likely to be opened out shortly. Possibly Mr. T. N. Christie, Mr. G. A. Talbot, or Mr. W. B. Kingsbury would be the best authorities as to when. In the meantime, however, it is as well to state that at present land may be bought at the rate of the dollar per acre, with a nominal annual ground rent of half that sum. To small capitalists then, the prospect ought to be inviting, because there can be "no doubt, no possible doubt whatever" that the conditions are favourable for the cultivation of the product, and that those who have already invested are anything but dissatisfied with the results of their experiments.

On one point, however, I was solemnly warned. However expert a Ceylon planter may be, he cannot hope to be a successful Selangor planter, until he has, so to speak, served an apprenticeship in the country. First and foremost a knowledge of the Malay language is essential, for although Tamil labour is largely used, it is next to useless in the preliminary work that has to be done, and for which Malays only are utilized. Secondly, it is necessary that the planter should know all about irrigation and the intricacies of drainage—drainage such as is little dreamt of in Ceylon. For instance, a clever prospector will see glorious possibilities in a huge sheet of water, that is a tract of flat ground, covered by two or three feet of water. The first thing to be done, of course, is to drain the water off the ground, and the second to do it in such a way as to prevent a repetition of the flood. This done the estate is ready for planting.

I have said that Tamil cooly labour is largely employed. From what I heard there seems to be no difficulty in the way of procuring this labour. A man is paid twenty-seven cents for a day's work, equal to about forty-five Ceylon cents, while a woman is paid twenty cents. Rain is plentiful, as is necessary for the cultivation of Liberian coffee, the average rainfall being anything between 80 and 180 inches.

What the future of the country may be it is, of course, impossible to say, but at present prospects seem very bright. The Government is doing its best to assist the planters, and fresh capital is continually being imported. To the outsider it would seem that the enterprise has already got beyond the experimental stage, and that the openings for and the probable rewards for small or large capitalists are enticing. It is, however, no place for the uncapitalized Ceylon planter, for, as I said before, the conditions and the nature of the work are very different to those here. Still it is as good a place as any other for the "creeper," and —what a chance for Lipton!—Local "Independent."

Cape Fruit.—The ss. "Tantallon Castle" has arrived from the Cape with 728 cases of fruit, consigned as follows:—202 cases of Grapes, to Mr Hudson; 195 cases do., to the Colonial Consignments and Distributing Company (Ltd.); 5 cases to W. R. Sutton & Co.; 86., and 20 cases of Pears, to Messrs. Woodhead, Plant & Co.; 120 cases of Grapes to Mr. E. Hudson; and 100 cases do., to Mr. Nathan. This entire consignment arrived in very good condition.—*Gardeners' Chronicle.*

THE CEYLON PROVINCIAL ESTATES COMPANY, LIMITED.

The second ordinary general meeting of the shareholders of this Company was held at Colombo on the 27th Feb., when the following report was presented and adopted:—

The Directors have the pleasure in submitting their report for the past year, 1896, together with a statement of accounts shewing the results of the Company's work from 1st August to 31st December last.

The accounts now submitted, taken in conjunction with those laid before the meeting held on the 5th September last, cover the Company's operation for the whole of 1896.

The expenses incurred in forming the Company, and the legal and other outlays attendant upon the purchase of the three properties, amount to R9,074·63 altogether, and after providing for that out of revenue the net earnings for the year come to R61,567·99.

On the 5th September last a dividend of 4 per cent was declared, and out of the amount now at credit of the Profit and Loss account the Directors recommend that a further dividend of 5 per cent be paid, in respect of the shares entitled to participate making 9 per cent for the year. The balance after setting apart a sum of R500 to meet remuneration to the Directors they have decided to employ in providing, as far as it will go, for what the Company has spent during 1896 in adding to the cultivated area of the estates.

The Tea extensions in 1896 represent 63 acres altogether (50 on Brownlow and 13 on Glassaugh), and it is in contemplation to clear and plant 30 acres more on Brownlow in 1897.

Since the Shareholders met in September last the purchase of Aadneven Estate has been concluded. The consideration given for it was £6,085 sterling in cash, and 122 shares of the Company taken at a premium of 40 per cent. The area of the property extends to 188 acres altogether, of which 170 acres are under Tea cultivation.

The total Tea Crop harvested in 1896, inclusive of some small sales on the Estates, was 368,367 lb. but in the case of Aadneven the Company got the benefit of 4 months' yield only (September-December). The average selling price of the Tea was about 48·82 cents per lb. and the cost of production 26.80 cents per lb. approximately.

The Estimates for 1897 point to an output of 370,000 lb. of Tea from the three Estates which it is expected will be put on the market for about 27·60 cents.

The following statement shews the area of the Company's properties:—

	Glassaugh and Aadneven.	Brownlow.	Total.
	Acres.	Acres.	Acres.
Tea in full bearing	426	400	826
,, in partial ,,	34	—	34
,, not in bearing	28	50	78
Forest	23	62	85
Waste and Grass	21	72	93
Total acres	532	584	1,116

VOGAN TEA COMPANY, LD.

The annual general meeting of shareholders of the Vogan Tea Company took place at Colombo on the 27th Feb.

The Annual Report was as follows:—

The directors have pleasure in submitting to the shareholders their report and accounts for the year ended 31st December 1896 which they think will be considered satisfactory.

The estimated crop for Vogan and Iddagodde was 265,000 lb., and for Barkindale and Stamford Hill 77,000 lb., *i. e.*, 342,000 lb., and the crop actually secured was as follows:—

	lb.		per lb.
Vogan and Iddagodde ..	275,666	realising a net average price of cts. ..	41·39
Barkindale and Stamford Hill	87,794	realising a net average price of cts. ..	53·02
Total..	363,460 lb., averaging cts.		41·23

The laid down cost in Colombo was for:—

	per lb.
Vogan and Iddagodde ..	cts. 23·06
Barkindale and Stamford Hill ..	cts. 31·35

or an average of cts. 25·03 per lb., which includes a sum spent on manure of R4,636·41, and the cost of making Iddagodde tea in Pantiya Factory for the first five months of the year, and of Barkindale and Stamford Hill teas in Annfield and Ottery Factories respectively for the whole year.

During the year under review 77 acres of tea were opened on Vogan estate, and a further 70 acres of forest were felled and burnt off out of 100 acres to be planted in 1897. For the latter, nurseries of dark-leafed Manipuri Indigenous Seed have been laid down.

At the extraordinary general meetings of the Company held on the 12th and 28th December last, the shareholders authorised the directors to accept the purchase of about 210 acres of land adjoining Vogan and Iddagodde estates, made by their authority from Government, and this addition to the Company's property is a valuable one. At the same the directors were authorised to issue debentures from time to time as required for the purposes of the Company, the aggregte not to exceed R100,000 at 7 per cent interest or less, on such terms of repayment and for such periods as they may deem expedient.

Up to the 17th of this month Debentures to the extent of R49,000 have been issued bearing interest at 7 per cent, and this rate of interest will be the rate for the balance of the Debentures when issued.

The Acreage of the Company's Estates is as follows:—

Vogan and Iddagodde	518	Acres	Tea in bearing
	24½	,,	,, in partial bearing
	126½	,,	,, not in bearing
	590	,,	,, Jungle
	70	,,	,, ,, (felled)
Barkindale & Stamford Hill	220	,,	Tea in bearing
Total..	1,549	Acres	

After writing off R2,731·53, half the amount of preliminary expenses, and setting aside R3,000 for depreciation of Buildings and Machinery, the balance available for distribution amounts to R58,520·09.

Of this sum R28,800 were absorbed by the payment of an interim dividend of 4 per cent for the six months ended 30th June last, and the Directors now recommend a further dividend of 4 per cent for the last six months, making 8 per cent for the year, and the carrying forward of the balance R920·08 to the next account.

As the Share Capital of the Company was not finally called up till about the middle of February, 1896, the Profit is really the result for under eleven months.

The iron work of the new Factory on Stamford Hill is erected and it is hoped that the Company's Tea will be manufactured there from some time in April next.

The estimated Crop for 1897 on Vogan and Iddagodde is 300,000 lb. Tea, and on Barkindale and and Stamford Hill 104,000 lb.

In accordance with the Articles of Association all the Directors retire, but, being eligible, offer themselves for re-election.

It will also be necessary to appoint an Auditor for 1897.

By order of the Directors,
Lee, Hedges & Co.,
Agents & Secretaries.

Colombo, February, 18th 1897.

THE TALGASWELA TEA COMPANY OF CEYLON.

The annual general meeting of shareholders of this Company was held at Colombo on the 27th Feb.

The Annual Report was as follows:—

Teas	..	703 acres
Other products	..	35 ,,
Forest and chenas	..	1,031 ,,
Total	..	2,039 acres.

The Directors have the pleasure to present to the Shareholders their Annual Ninth Report with a duly audited statement of the Company's affairs as on the 31st December, 1896.

The crop for the year turned out 150,200 lb. of tea against an estimate of 160,000 lb., and was all sold locally at an average of cts. 42·70 per lb. against an average of cts. 47·52 per lb. for the previous year.

After payment of interest on preference shares and writing off the usual amounts for depreciation, there remains a balance of R6,209·78 for disposal and the Directors propose the payment of a dividend on the Ordinary Shares of 3 per cent carrying forward the balance.

During the year, the planting of coconuts, recommended in the last report was proceeded with, and 200 acres have been lined and holed of which 75 acres have been planted. The Directors intend increasing the acreage under this product.

The estimate for 1897, is 170,000 lb. tea. Messrs. S. Agar and H. VanCuylenburg retire from the board by rotation and are eligible for re-election.

The appointment of Auditor also rests with the meeting, and Mr. Guthrie offers himself for re-election —By order of the Board of Directors,

Baker & Hall, Agents and Secretaries.

TRAVANCORE TEA ESTATES COMPANY, LIMITED.

Registered February 1, by Murray Hutchins, Stirling and Murray, 11 Birchin-lane, E.C., with a capial of £150,000 in £1 shares, divided into 75,000 referred and 75,000 ordinary. Object, to adopt and arry into effect a certain undetailed agreement for he acquistion by purchase or otherwise for the following tea estates situated at the Peermad district, in Travancore, in Southern India, the same being known respectively as Bon Ami, Mount Nanja, Mully, and Kole Kannam, or any of them, or any parts thereof, and to develop and turn to account the same in such manner as the company shall see fit; and, generally, to carry on business as planters, growers and producers of tea, coffee, cinchona, cocoa, cardamoms, and other plants, trees, and natural products of any kind in India or elsewhere; to prepare for market tea, coffee, rice, and other products; as warehousemen and carriers by land and water; to work mines and quarries, and to find, get win, work, crush, smelt, manufacture, or otherwise deal with ores, metals, minerals, oil, precious and other stones, or deposits or products; to carry on the business of mining in all its branches; to acquire work, and turn to account any patents, patent rights, &c.; to build and work tea factories, coffee-curing mills, factories, tram roads, &c. The signatories are :—

	Shares.
H. K. Rutherford, 21, Mincing-lane, E.C. ..	1
D. Reid, Shootfield, Sevenoaks	1
H. Tod, 21, Mincing-lane, E.C.	1
W. R. Grant, 101, Leadenhall-street, E.C. ..	1
W. H. Anderson, Rupert Lodge, Burnham, Maidenhead	1
W. Johnston, Bart., 21, Mincing-lane, C.E. ..	1
W. Mackenzie, 39, Netherhall-gardens, Hampstead	1

Registered office: 21, Mincing-lane, E.C.—*H. and C. Mail*, Feb.19.

A LESSON IN GARDENING IN CEYLON.

(*By a Planter in a Medium District.*)

Nallamma, my principal kangani's wife, had, no doubt, many attractive qualifications. In addition to an unusually clear complexion and features that any artist would have been delighted to transfer to canvas, her charm of manner was irresistible: always apparently happy, in spite of domestic cares, bright without effort and jocular without freedom on the one hand or loss of dignity on the other. But her chief attraction in my eyes was her constant love of gardening, and I determined one morning to inspect the kangani's garden, and to do what I could to encourage their cultivation. It had occurred to me, too, that it would be a good plan to give the kangani the greater part of my newest lot of English seeds on the understanding that he should supply me, at moderate prices, with any surplus vegetables he produced. Such things as peas, rhubarb and celery, of which the average Tamil cooly knows nothing, I would continue to cultivate myself, but it seemed probable I should get better results from beans and cabbages, if grown in the kangany's garden than in my own. This idea I should certainly have carried out, but for the fact that I was then only an assistant on the estate, and liable like junior officials to sudden removal by ill-health or promotion.

I had finished my morning's round of work with unusual celerity, and at ten o'clock had ample time to visit the garden on my way back to the bungalow. I found Nallamma not exactly at work, but reaping the fruits of her labours, or rather of her supervision; for, of course, she did not stoop to violent manual effort personally: working by deputy, to those who have that gift, is very pleasant and less conducive than actual physical exertion to rheumatism and back-ache.

I suppose she must have noticed an avaricious look in my eyes, for, she asked me, as soon as I approached the narrow entrance in the fence, what it was I wanted. I told her I merely wished to have a look at her garden, on which she cast a somewhat dubious downward glance at the brinjals and chillies she was carrying in the folds of her cloth.

I crawled sideways through the gap, taking off my broad pith topee, and at once began my examination. I found, just as previous hurried inspections had led me to expect, her garden fully occupied by native vegetables of all sorts, and all of them seemed to be in much better condition than any that my garden could boast of. There were several things too growing in it, which were new to me.

'What is this?' I asked, as we came to a bed of tall plants with showy yellow flowers, apparently a species of *Hibiscus*.

'We eat the leaves in curry', she replied, 'they are very good but acid.' Nallama had very fine teeth and I could not help telling her so. 'Ah,' she said, with a pitying air, 'you don't chew betel.'

'You eat these leaves too,' I asked, looking at some slender trees with large, graceful, cream-coloured blossoms. 'Yes, of course,' she replied, 'and the *Agati* flowers too, when not wanted for seed.'

'And these two are edible?' I enquired, pointing to a small bed of foliage plants very like the *Coleus* in my front garden, but with no red or yellow or purple tints in the leaves. 'Yes,' she answered, 'we call them small potatoes: the little tubers are very good, and the plants bear in two or three months' time.' I began to feel that my knowledge of gardening was still capable of expansion.

'Why don't you grow some of our English vegetables,' I suggested rather feebly. 'I would give you seeds or plants.' 'We find these quite enough', she said: 'yours would take up too much space and they might not be of use in curries.' 'But,' I observed, 'you could make a larger garden and try some of them. At any rate you might cut out some of these useless plantains and grow better things there.'

'The plaintains,' she remarked, with a merry laugh, 'are not useless. We get six or eight bunches a year from each always, and the best kinds are

worth a rupee each.' I must confess I felt rather sceptical on this point. I had about a hundred trees growing on two sides of my garden, and got only one bunch from them in about three months.

"Your bungalow servants perhaps take them," she suggested: "every kind is good for cooking if cut before they ripen." This was rather distressing. I had fancied I knew something about plantains and certainly lost no opportunity of pointing out to Ramasamy each flower as it appeared, but I reflected sadly that a great many flowers had borne no fruit for me. I continued my search in hopes of finding some vegetable as to which I might offer hints of improved cultivation, but in vain. Even the onions, of which my cooly had planted several beds at different times, with what I considered good results, were finer and much regular than mine.

"Do you make much flour from your arrowroot plants," I asked, feeling that I might have a chance of telling her how to prepare it. "Not more than you do," she replied with a merry light in her eyes, "but you grow yours in pots in your verandah." "Yes," I assented, "mine are merely ornamental," and I began to explain how the tubers should be cleaned and converted into flour. "I used to make some every year," she said, with a gracious air, "before you came here, but we can get arrowroot and other things from you whenever any of the children are ill. You sometimes give away these things," she added, "to coolies, who are not really ill," and she mentioned two cases in which my charity had recently been evidently carelessly administered.

"Your *bandakai* plants," I observed, "seem to give a large crop: it is a pity they haven't a better flavour. "Oh," she replied, "we like them well enough: the kangani is very fond of them." Perhaps your servant doesn't cook them properly. Different vegetables require different curry-stuffs." This was a point I had never considered; my appu had unlimited curry materials to work with, but there was a sameness about his curries that made them disgustingly monotonous and the dishes often went back to the kitchen almost untasted. I remembered having once suggested that the curry should be given to the fowls, but reflected now that I had never seen the poultry regaling themselves on curry.

"What are these plants," I asked, pointing to some with broad ash-coloured leaves. "Those are a very good kind of yam," she answered: "we eat the stems and the yams too when the porcupines don't destroy them. It was to catch them that my husband borrowed your large rat-traps last month, but they were no use. The porcupines are too clever, and the only plan is to shoot them. But," she added, with an assumed tone of regret, "we caught your horsekeeper's dog, and it is still very lame." The dog had done a good deal of damage in my own garden and I could not conceal my delight.

I failed to find in the garden anything of which either the roots, leaves or fruits were not edible till we came to a couple of low spreading plants with long spikes of red flowers. "This is certainly ornamental," I observed, "but perhaps you use it for curry." "No, for medicine," she replied; "the roots are used in certain cases by Tamil women." I thought it hardly safe to venture further enquiry. I had supposed I knew something of medicine, both European and Oriental, having experimented with many hundreds of sick coolies, usually very successfully, though often, I fear, to our mutual surprise, but this perhaps was a branch of medical lore that I had not yet taken up. Nallamma seemed puzzled at my silence, and I made an effort to continue the conversation by complimenting her on possessing a garden containing nothing useless. "Yes," she remarked, "we do not grow flowers like you do in front of your bungalow; we can get from you all the flowers we want for our temple festivals. I congratulated her on getting so much more produce from a small bit of ground than I could from my larger garden."

"I suppose you get seeds given you by all the other coolies who keep gardens," I suggested." "No," she replied, with an air of dainty scorn, "not at all. We give away a great many."

"But how do you manage to get such fine crops," I asked. It occurred to me that perhaps a little of the artificial manure, intended for the coffee trees, was occasionally used, but the suggestion was met by a decisive negative. "We use only cattle manure and ashes," she observed, "and, of course, water the garden regularly." "My garden cooly does the same, I replied, "but nothing seems to grow as well as it ought to. My coolies cost me about twelve rupees a month, and I buy about ten rupees' worth of seeds each season. Ramasami uses the best tools I can get and a very fine watering-can, but even the cabbages don't grow properly and half the seeds don't come up." "I'm afraid," said Nallamma, "you don't look after him sufficiently: you have'nt time."

This was such an unexpected compliment, and said in such a graceful way that I felt not only pleased but convinced that she was right. "We irrigate our garden from the water course," she added, "and I sprinkle my plants lightly with water from a chatty. Ramasami perhaps sows your seeds in wet weather or does not use the rose of your watering-can except when you are in the garden." And then she continued, with gentle emphasis, "I always sow our seeds myself." I felt that I was acquiring knowledge fast, but did not like to admit it. I argued that my garden-cooly, having no fixed task to do and having generally a fairly easy time, was not likely to shirk such a simple work as watering. "I don't know," she said, "he may be a very good cooly"—her features expressed other disbelief—"but your garden has as good soil as this; I expect it is his fault if your plants don't grow right. His brother has a garden nearly as good as ours. You need not tell him I said so," she observed with a plaintive look. "No, my dear," I answered, with that familiarity which naturally arises from a mutual interest, "I will say nothing, but I will look after him more carefully."

"Do you use these also for curry?' I enquired, pointing to some small plants growing near the entrance, 'or are they used for drugs"? "No," she replied gaily, "I have never heard of their being used for either purpose, but the fresh leaves are good for insect bites, and, when rubbed on one's face, remove sun-burn. "Oh!" I exclaimed, looking closely at her clear cheeks, "I can understand why you grow it." She did not seem offended, but advised me to plant in my garden: "Some day," she added, "when you have children, you will find it useful." Apparently she knew something of my matrimonial intentions: my appu had evidently been reading my home-letters, (I did not know he could read English), and the kitchen gossip had reached the cooly-lines.

"I think it is time I went back to breakfast," I remarked. "Yes," she assented "it is late, and you must be feeling hungry." And I wished her "good morning" with a rather painful consciousness that, instead of having given Nallamma any hints on Gardening, she had instructed me in the first principles of horticulture. And this feeling was certainly not lessened when she sent me, in the evening, by her little son, a collection of seeds, a magnificent cabbage and a dish of beans. GIPSY JOHN.

JADOO CRITICISED.

"Toda" writes as follows, under date of 13th instant:—

As you published Colonel Halford Thompson's letter, which appeared in the *Madras Mail* of 12th January, criticising a letter of mine *re* Jadoo Fibre, which was inserted in the *Mail* of 19th November 1896, I would ask you in fairness to kindly publish in the next issue of *Planting Opinion*, my reply to Colonel Halford Thompson's letter which you will find in the *Madras Mail* of 4th February, signed "Toda."

We regret we have not sufficient space to quote the letter in full, which occupies a full column of very small print in our contemporary, but we trust "Toda"

will find the omissions in no way impair the weight of his crushing rejoinder.

Colonel Thompson says :—"It is difficult to conceive how £7-10 0 per ton at Madras (now reduced to £7) could by any means swell to R170." Messrs. Parry and Co. tell me they can supply the fibre at R7 per bale of 1 cwt., on rail at Madras. Add another R30 for cost of carriage, (a fair estimate, seeing that the majority of estates are many miles from the Railway Station,) and the present price comes to R170 per ton. In Colonel Thompson's prospectus it was claimed that Jadoo fibre would be useful in two ways, so far as coffee planting was concerned. (i) In the "raising of nursery plants." (ii) In "bringing on supplies," and with these uses I dealt in my original letter. In regard to the first I said "now as to the cost of raising nursery plants." The prospectus states that a 3 bushel sack of Jadoo should be sufficient for "raising 450 (nursery) plants." The ton is said to contain 60 bushels, so that the cost per plant would be about 3⅝ pies. This means an expenditure of—about—R1,650 on the *purchase* of Jadoo alone, in the case of a nursery, for a 50 acre clearing, planted 5' x 5'." Colonel Thompson says this calculation is wrong because I "have taken the quantity of Jadoo equired for a seed bed large enough to raise 450 seedlings at a time"—it will be observed that Colonel Thompson admits the quantity given in the prospectus, a three bushel sack for 450 seedlings is correct—"(but which could be used again and again so that 20,000 seedlings could be raised from it) as the basis of a calculation based upon the original 450 seedlings being the whole quantity that could be raised out of that amount of Jadoo." The circular says nothing about the possibility of using a given quantity of Jadoo "again and again," but this does not affect my calculation in the smallest degree. If it takes a 3 bushel sack to raise 450 seedlings (as Colonel Thompson admits) then, with the price of a ton at R170, each seedling would cost 3⅝ pies, and a nursery for a 50 acre clearing planted 5' x 5' would entail an expenditure of R1,650. Colonel Thompson draws an alluring picture. You buy your 3 bushel sack of Jadoo, and raise your 450 seedlings by its aid every year for the term of your natural life. Then you leave it to your successors as an heirloom, who do the same, and so on to the crack of doom. The only drawback is that as a 50 acre clearing would require a nursery of 90,000 plants as a minimum, and as you can only raise a nursery once a year, it would, at the rate of 450 plants per annum, take about 200 years to plant the clearing up. The new light that Colonel Thompson throws on Jadoo, viz., that it can be used for a series of years as it does not lose its efficacy, would of course reduce the cost of a nursery in *subsequent* years, so far as the purchase of Jadoo is concerned. Before I leave this question, I would add that it is "difficult" for one not in the know "to conceive" how Jadoo *can* be used again and again. The testimonials printed with the prospectus, and those given in the *Madras Mail* of the 9th December, imply that, when Jadoo is used in a nursery, it encourages root growth in a wonderful way, and that, when the seedlings are large enough to be put out in the field, the fibre is a mass of fibrous roots. How then is the fibre to be retained for future use, without serious injury to these fibrous roots? I trust Colonel Thompson will make this point clear. With regard to the second use I said (I quote from my original letter), "But these figures pale into insignificance before the cost of 'bringing on supplies.' The prospectus gives ¾ peck as the quantity each supply should receive.

= 3 16 bushel,
or, say, 1 bushel for 5 plants,
= 1 ton for 300 plants,
= 9 ans. per plant"

On this head Colonel Thompson says "the amount of Jadoo required for raising seedlings in beds to supply 50 acres would be certainly not more than 5 cwt. and would cost therefore R42·8 instead of R1,650 as calculated by 'Toda.'" Every word of this sentence is inaccurate, and it is here that Colonel Thompson gets into a state of more "hopeless confusion" than anywhere else in his letter. In the first place I never said that "the cost of raising seedlings in beds to *supply* 50 acres would be R1,650." The calculation in which those figures were given had reference solely to cost of a nursery for planting up a 50 acre opening. Colonel Thompson is evidently unable to distinguish between planting up a new clearing, and supplying an old estate. (Query. Has he ever seen a coffee estate?). Further the large quantity of Jadoo—¾ peck—given in the prospectus as the amount necessary for each supply, shows clearly that the prospectus did not contemplate the "raising of seedlings in beds" as supplies. It meant that that amount of Jadoo should be applied to each supply in the field. Again, it is not in the power of Colonel Thompson or anyone else to say that the amount of Jadoo required for "raising seedlings in beds to supply 50 acres would be certainly not more than 5 cwt." or *any* fixed amount, for the simple reason that 'supplying" is a variable quantity. Granting that ¾ peck is the right amount of Jadoo for each supply (and Colonel Thompson does not deny it), how many plants would 5 cwt.—the amount fixed by Colonel Thompson as sufficient for a 50 acre clearing—cover? The ton contains 60 bushels, so 5 cwt. would contain ¼ of this or 15 bushels. At 1 bushel for 5 plants, this would mean (5 by 15) = 75 supplies. Well A's 50 acre clearing (lucky dog!) might need only 75 supplies, while B's clearing of a similar extent might need 7,500. What then becomes of Colonel Thompson's fixed price of R42·8 for supplying 50 acres? On the lines marked out by Colonel Thompson, it is impossible to arrive at any definite conclusion as to cost of supplying. My calculation is the correct one, viz. that if it takes ¾ peck per supply, then it costs 9 ans. per plant, with Jadoo at R170 per ton. One thing is obvious from Colonel Thompson's letter that, however great his theoretical knowledge of the merits of Jadoo may be, he knows absolutely nothing about its practical application to coffee. The figures given in the Jadoo prospectus are either right or wrong (and Colonel Thompson in his letter implies they are right). These figures are a 3 bushel sack of Jadoo for 450 plants in the case of a nursery, and ¾ peck for each supply (to be applied of course in the field). If these quantities are right, my calculations are right, in spite of the tissue of nonsense contained in Colonel Thompson's letter. If they are wrong, the sooner Messrs. Parry and Co. (who have a practical knowledge of coffee planting) correct them, the better for everyone interested in the question of Jadoo bre.—*Planting Opinion*, Feb. 20.

LECTURE ON RHEA.

An interesting and instructive lecture entitled "Rhea—its History and Prospects" was delivered at a meeting of St. Andrews' Guild on the evening of the 12th by Mr. J. Melrose Arnot, F.C.S. There was a large attendance. The Hon. Sir John Woodburn (President) presided and introduced the lecturer.

The lecturer dealt with the subject in detail. At the outset a description of the plant was given, showing its essential features by means of diagrams and growing plants. Then the history of the plant was passed in review, and the lecturer stated that the fisherfolks of India, China, and the South Sea Islands were probably the first people to make use of the fibre and to cultivate the plant, which he said they still continue to do. He then handed round samples of the hand-cleaned fibre which had been obtained from the fishers of Dinagepore at a cost of R2 per seer. The methods of cultivation and propagation followed in Asia and China were described, and it was pointed out that a rich sandy loam in a warm and equable climate with a good rainfall, well distributed throughout the year, is the most favourable circumstance for the production of good crops, which may be gathered four or five times per year. The lecture then insisted upon the necessity for liberal manuring and careful cultivation, enforcing the point by means

of tables showing composition of plant and soil, and remarking that although one part of Bengal seemed to suit the plant fairly well in common with other crops, it suffers severely from long drought. The primitive modes of preparing the fibre were described, and then the various modern processes were reviewed, special attention being devoted to the Gomess process, the Macdonald.Boyle process, and the process of Mr. J. S. Brown, Bally Paper Mills, a working experimental model and complete drawings of whose machines were exhibited. The lecturer then said all fibres have this in common, that they are elongated cells, but they vary greatly as to length, thickness, form of section, shape of ends, hardness, softness, elasticity, flexibility, lustre, and strength. All fibers of one class however have characteristics in common, that is to say, that all fibers obtained from one natural order or family of plants so closely resemble one another as to be only with difficulty distinguished. In the textile industries, for instance, we have a wide range of easily recognisable fibres, as cotton and jute, hemp and flax, wool and silk; but the various varieties of cotton can only be distinguished by an expert, and same may be said of hemp and of the animal fibres, wool and silk, although they are not cellulose. In the paper industry we have a much wider range of fibres, and many of them so closely alike that we have to depend on the appearance of some invariable complement to the fibre, such as the cells of the pith or the leaf-hair of grasses to identify them. I have here prepared a table to show the chief physical characteristics of the most important commercial fibres, and you will see that for length, strength. and lustre, rhea far transcends all the other vegetable fibres. And besides all this it combines with its rare whiteness an affinity for colouring matters which is not approached by any other normal cellulose. Jute dyes excellently, but jute is a very pronounced tegno-cellulose, and the colours, when dyed, lack the purity of tone which they show so admirably on rhea. Chemically considered rhea is a pecto-cellulose like all the other finest textiles, as linen, hemp, and cotton. When we consider what may be the future for rhea, we must be careful to bear in mind that none of the people to whose lot it will fall to make a success of it have any experience yet. That the fibre can be extracted so successfully as to leave little to be desired is, I think, beyond a doubt; but the growers are onyl experimenting yet, and so we have no good supply of regular qualities of fibre, and consequently the spinner has to work upon an uneven material whose qualities he has not yet mastered. Cultivation and frequent cropping improve both the strength and fineness of the fibre, and when the plant is produced largely and steadily, we may expect to see a great advance in every direction. The fibre combines well with silk, flax, and wool, and, when alone, it rivals the more ordinary sort of silk. Moreover, it enjoys an advantage which silk has not—it may be converted into the most excellent paper after it has become useless for any other purpose. When a sufficient supply is forthcoming, machinery will be modified so as to obtain the best result. Much has been said about rhea as a substitute for jute; but jute is more easily cultivated, and the rayat would, I fear, fail to give rhea the manuring and attention which it demands during the greater part of the year, so that most likely rhea would not be widely cultivated in the jute districts, and the jute business would still continue. The whole future of rhea now depends, on the cultivator, and there is every reason to believe that in many districts it may be grown at a profit. I have heard that the company which is working the Gomess patents can manufacture rhea *filasse* as cheaply as cotton is produced, but as the raw material is not sufficiently abundant that would not continue to be the case in the event of a largely increased demand arising soon. At present they are producing about two tons weekly. But the rhea fibre is more likely to become a serious rival to flax and wool than to jute. Jute is indeed among textiles, as like newspapers in another sphere, often used for nobb ends, but, as a rule, doing the drudgery of the world and cast aside when it has accomplished its more immediate purpose.

The President congratulated the lecturer on his successful lecture and demonstration, and in opening a discussion on the subject of rhea, said that Lord Mayo's Government in offering a reward of £5,000 for the best process for preparing rhea had begun at the wrong end. The principal problem which had alone to be solved was the difficulty of getting the material in sufficient quantity in India. It had been shown that the climate of Bengal was not suited to its cultivation; it required a moist and equable climate, otherwise interruptions occurred in the fibre which was fatal to its utilisation. He understood that a keen controvercy was going on among botanists as to whether the mistake had not been made of growing the tropical species of rhea in semi-tropical regions and the semi-tropical in regions similarly unsuited to them. Surgeon-Major Prain followed and confirmed what Sir John Woodburn had said with regard to the confusion which existed with regard to the species of rhea most suited for manufacturing purposes. There was little doubt that the tropical species was the one which Dr. Roxburgh had originally introduced from Sumatra, and was therefore not suited to India generally. He said that Dr. George Watt had lately proceeded to Assam with the object partly of ascertaining which species is the true rhea. Mr. John Gemmell, in the course of a few remarks, said that the plant had been tried as an experiment in several tea gardens in Assam with some success, but that the cost of cultivation had acted as a deterrent to its extended introduction. Messrs. George S. Sykes, James Luke, and G. W. MacMinn also contributed to the discussion.—*Indian and Eastern Engineer*, Feb. 20.

"TEA AND MANURING."

A young planter who has been interested in the discussion on the above subject wants to know whether, as a matter of fact, tea has ever been known to be killed through manuring; and, secondly, whether tea, once manured, and improved in yield, has ever been known to go back to less than the original crop per acre? We are not so sure about the second; but surely a negative is the only answer to the first question!

An old and practical planter writes on another controverted point:—

"As regards 'cultivation' in previous correspondence, the 'opinion' of some that returning green prunings to the trees poisons them, my *experience* in tropical cultivation of over 30 years is that under proper conditions this gives some of the very best results!"

UDUGAMA TEA AND TIMBER COMPANY LIMITED.

At the annual general meeting held on 1st March 1897, the following Report was submitted:—

The directors submit to the shareholders the accounts for the year ending 30th September 1896.

The yield for the Saumarez, Udugama and Homadolla amounted to 144,359 lb., an increase of 17,065 lb. on the previous year. This comes to 288 lb. per acre all round.

For the present year ending 30th September 1897 the estimated crop is 155,000 lb.

Of the cleared land in Maminadola 144 acres planted in 1895 have come on very well and should be in bearing next year; 85 acres were planted last year and are looking very healthy, and 81 acres are now felled and are ready for planting. It is estimated that when all these clearings are in bearing they should yield 150,000 lb.

been applied over about 20 acres, the total area manured since the Company acquired the property being computed at 414 acres.

The Company's Property consists of:—

476 acres Tea under leaf. Yield in 1896= 426 lb. Tea per acre.
50 „ Forest.

Total.. 526 acres.

About 4 acres are to be brought into cultivation during the year.

The estimated crop for 1897 is 190,000 lb. Tea.

It will be seen that the property representing Capital stands in the balance sheet at approximately R501 per acre cultivated, as compared with about R508 in the previous year's account; and that the profit per acre is about R68·00, as compared with R84·00 in the previous year.

Mr. John Albert Martin retires from the Board by rotation, and is eligible for re-election.

The Shareholders will be requested to elect an Auitor for the current year.—By order of the Directors,

B. G. L. BREMNER, Secretary.

Colombo, 24th Feb. 1897.

THE BOGAWANTALAWA DISTRICT TEA COMPANY.

The Bogawantalawa District Tea Company Ltd., has been registered with a capital of £250,000 in £10 shares of which 12,500 are preference, and 12,500 are ordinary. Object to adopt and carry into effect an agreement expressed to be made between this Company and C. Fetherstonhaugh, Sir George William Campbell, K.C.M.G., A. Tabor, and J. C. Fort for the acquisition, by purchase, lease or otherwise, of any land and buildings in Ceylon or elsewhere, and any estate of interest in or any rights connected with any such lands and buildings, and in particular the Kirkoswald, Bridwell, Elbedde, and Bogawane estate, Dikoya, Ceylon, or any of them, and, generally, to develop the resources of, and turn to account the said properties by clearing, planting, cultivating, farming, grazing, mining, and building thereon. The signatories are:—

		Share.
C. Fetherstonhaugh	Hurst Lodge, Twyford, Berkshire	1
A. Tabor	Sunnydene Eastbourne	1
J. C. Fort	Forest Lodge Ashford, Surrey	1
H. Bois	5, Ashwood-road S,. Kensington	1
C. M. Robertson	12, Fenchurch Street, E.C.	1
J. G. Forster	12, „ „ „	1
E. Bois	12, „ „ „	1

The directors shall not be less than three, nor more than five; the first are the first four subscribers. Qualification £1,000. Remuneration, £500 per annum with a percentage of the profits divisible. Registered Office, Fenchurch Street, E. C.

THE YATADERIA TEA CO. OF CEYLON LIMITED.

The annual meeting was held on 5th March.

The Directors' report is as follows:—

The Directors have the pleasure to submit the Balance Sheet and Profit and Loss Account for the year ending 31st December, 1896, duly audited.

The balance of Profit (including R10,120·84 brought forward from last year, after crediting Reserve Fund with R15,000 as voted at the last General Meeting; and after writing off for Depreciation of Buildings and Machinery as shown by the accounts) is R74,329·43. Of this sum R23,750 has been absorbed in paying an Interim Dividend at the rate of 12½ per cent; and the Directors propose that a further Dividend of 12½ per cent, and a bonus of 7½ per cent absorbing R38,000 be declared and made payable on the 8th March; that R5,000 be transferred to the Reserve Fund account and that the remainder of R6,329·43 (after paying R1,250 special fee voted to the Directors at the General Meeting in 1895) be carried forward.

It will be seen that the property representing capital stands in the Balance Sheet at approximately R204 per acre cultivated, as compared with about R255 in the previous year's accounts, and that the profit per acre is R87.

The Factory extensions referred to last year have been nearly completed; and a new turbine and sifters have been erected.

The total Tea crop was 544,159 lb. or 82,341 lb. less than estimated in the last report, rather finer plucking having been adopted with a view of improving prices, which as far as can be judged was successful. The plucking area was 768 acres. The total quantity of Tea for disposal was 545,393 lb. including 1.234 lb. made from purchased leaf, of which 12,988 lb. were sold locally averaging 27·28 cents per lb.; and 532,405 were shipped to London, of which 102,160 lb. had still to be accounted for; but the average obtained for the 430,245 lb. as yet accounted for is 33·24 cents per lb. The cost of the Tea delivered to buyers or put on board ship, including all charges and Depreciation of Buildings and Machinery, was 20·59 cents per lb. (being ·08 of a cent more than in 1895). The net value realised from sales (a portion being estimated) was 32·34 cents per lb. (being 4·83 cents less than for the previous crop). The sum written off for depreciation represents ·71 cents per lb. of the cost.

The Company's property (including 96 acres purchased during the year) consisted on the 31st Dec. 1896, of:—

	Acres.	Tea planted in.	Yield in 1896.		
880 Acres Tea.	172	1885	793	lb. tea per acre	Average yield from 768 acres 709 lb.
	208	1887	730	„ „ „	
	100	1888	723	„ „ „	
	42	1889	792	„ „ „	
	6	1890	811	„ „ „	
	52	1891	939	„ „ „	
	120	1892	757	„ „ „	
	68	1894	160	„ „ „	
	37	1895	not in bearing.		
	75	1896	„ „		
	22	Cocoa and Factory site.			
	255	Forest, &c.			
	1,157	acres as per last report.			
	96	„ purchased from Crown and Natives.			
	1,253	Total acres.			

The Directors propose an extension of about 35 acres Tea in 1897, which has been cleared.

The estimated crop for 1897 is 537,600 lb. Tea.

Mr. John H. Starey retires from the Board, in terms of the Articles of Association, and being eligible, offers for re-election. Mr. David Fairweather resigned his seat at the Board on leaving the Island, and the Directors elected Mr. Charles Minto Gwatkin in his stead.

The Shareholders will be requested to elect an Auditor for the current year.—By order of the Directors,

B. G. L. BREMNER, Secretary.

Colombo, 24th Feb. 1897.

INDIAN TEA CROP.—The Indian Tea Association publish the following figures showing the actual outturn of the Indian tea crop of 1896:—Assam, 59,655,793 lb.; Cachar, 20,401,487 lb.; Sylhet, 25,099,486 lb.; Darjeeling 7,817,495 lb.; Terai, 3,738,927 lb.; Dooars, 22,073,781 lb.; Chittagong, 1,030,125 lb.; Chota Nagpore, 220,322 lb.; Kangra, 2,180,000 lb.; Dehra Doon and Kumaon (Estimate), 2,000,000 lb.; Private and Native Gardens (Estimate) 4,000,000 lb.; total, 148,217,416 lb. The total shipments to all places from 1st April to 31st January 1897 are 138,171,829 lb. The exports to the Colonies and other ports, together with local consumption, are not likely to exceed 16 millions, which will leave about 131½ million pounds for export to Great Britain.

THE EILA TEA COMPANY OF CEYLON, LIMITED.

At the meeting of the Eila Tea Company of Ceylon, Ltd., held at the offices of Messrs. J. M. Robertson & Co., on the 6th March 1897, the following report of the directors was presented and adopted :—

The directors have the pleasure to submit their report and accounts for the year ending 30th June, 1896. The crop on Eila estate has slightly exceeded the estimate, but the crop from Kanangama was a little under that estimated. The total crops from the two estates amounted to 358,066 lb. against an estimate of 360,000 lb. The price realized for the tea was not altogether satisfactory and the net average of the tea sold from the two estates was 37-97 cts. against 42-83 cts. last year. The net profit for the year, after allowing R6,100·49 for depreciation, is R44,657·11 (equal to nearly 15 per cent on the capital of the Company) to which must be added the balance brought forward (after payment of the dividend for 1894-95) of R2,095·13 together aggregating R46,752·24. Out of this an interim dividend of 4 per cent has been paid leaving R34,752·24 available for distribution. The directors recommend that this be disposed of as follows, viz :—That a final dividend of 9 per cent be declared on the share capital of R300,000, making

13 per cent for the year.. ..	R27,000 00
That a sum be carried to Reserve Fund of	R6,000 00
Leaving to be carried forward to next account	R1,752,24
	R34,752 24

The estates on 30th June, 1896, consisted of Eila, 410 acres tea, 5 years old and upwards; 50 acres tea, 2 years old and upwards; 105 acres tea, 1 year old and upwards; 62 acres tea, under one year; 330 acres forest, total 957 acres.

Kanangama, 20 acres tea, 5 years old and upwards; 15 acres tea, 4 years old; 108 acres forest, total 323 acres.

Mr. H. Tarrant rotires in accordance with the articles of Association, but being eligible offers himself for re-election. The shareholders will also have to elect an auditor for season 1896-97.

THE RATWATTA COCOA COMPANY, LIMITED.

An ordinary general meeting of the shareholders of this Company was held at the Company's Offices at No. 20 Baillie Street on the 6th March 1897.

The following is the report of the directors :—

The Directors have the pleasure to submit their fourth annual report, together with a statement of accounts for the year ending December 31st, 1896. The accounts show that the Company's property stands at a nett cost of R120,941·27. For this capital outlay the shareholders have a property consisting of 789 acres. The definition of the estate as at present constituted is as follows :—

	3 Years old.	2 Years.	1 Year.	Total.
Tea and Cocoa	86 acs.	9 acs.	—	95 acs.
Cocoa ..	66 ,,	109 ,,	81 acs.	256 ,,
Liberian coffee and tea ..	15 ,,	9 ,,	— ,,	24 ,,
Liberian coffee	—	—	11 ,,	11 ,,
Grass ..	—	—	—	3 ,,
				389 ,,
Coconuts planted	—	2,000	4,000	
Forest—normally				400 ,,
			Total ..	789 ,,

Besides opening and planting this land, a substantial Superintendent's bungalow has been built of bricks, tiles and sawn timber. A cocoa store, of brick and iron roof, is nearly completed, and the necessary cooly lines. In view of the low prices obtained for cocoa in late years, and the success of tea in the Matale district, your Directors called a general meeting of shareholders to discuss the subject; when it was resolved that only the best fields of cocoa (about 200 acres) should be retained as cocoa, and that the cultivations of teas be extended as fast as possible, thus not rendering the Company dependent on only one product. The capital of the Company was raised from R150,000 to R200,000 to allow of this programme being carried out. With this double cultivation, the Directors look forward to the future with confidence. Valuing the reserve forest at R50 per acre, it will be seen that the cost per acre of cultivated land is R285 per acre, a figure which must be considered moderate, remembering that the land is all young and coming into bearing. When the whole estate of nearly 800 acres is under cultivation (which it is hoped it will be in 1,900), the Company will have a very valuable property, as it is now known from the statistics of an adjoining estate, that the district grows tea equal to the best in the Island for quantity. Work of 1897—100 acres of forest will be cleared and planted with tea, and as much of the exposed cocoa land as can be done. Directors—Mr. E. Jeffries retires from the Board, but is eligible for re-election. An Auditor will also have to be elected.

THE UPPER MASKELIYA ESTATES COMPANY, LIMITED.

The annual ordinary general meeting of the above Company was held at the Company's Offices, No. 7, Queen Street, Fort, Colombo, on the 6th March 1897.

The directors' report was as follows:—

Acreage 31st December, 1896.

	Brunswick & Bloomfield.	Caskieben.	Total.
Tea in full bearing	446	200	646
Grass, Timber Trees, &c.	72	7	79
	518	207	725

The Directors have now the pleasure to submit to the Shareholders the Accounts of the Company for the past year.

The yield of tea from Brunswick and Bloomfield has been well maintained, the crop for the year having been 229,238 lb as against 227,359 lb in 1895, while the prices obtained may be considered satisfactory, in view of the course of the Tea market and of exchange, the net average for 1896 having been 45·60 cents per lb as against 48¼ cents in 1895.

The profits and receipts from sources other than sales of Tea amounted to R5,610·16 against an estimate of R8,800, the shortfall being almost entirely due to the purchase by the Company of Caskieben Estate.

At Extraordinary General Meetings held on 5th September and 10th October, 1896, Special Resolutions were passed increasing the Authorized Capital of the Company to R350,000 to provide for the purchase of Caskieben Estate. The 160 shares of the second issue have all been taken up by holders of those of the first issue, and Caskieben has been duly conveyed to the Company.

The purchase of Caskieben dated from 30th May, from which date to 31st December 46,225 lb. Tea were secured and sold on the Company's account at a net average of 44·25 cents per lb. The outlay on the Estate for the same period amounted to R12,636·29, equal to 27·33 cents per lb. on the crop secured. From the profit thus realised falls to be deducted R3,715·75 interests paid to the Vendor from 30th May to 30th October, which is duly shewn in the Accounts.

The Capital Account outlay for 1896 amounted to R1,468·44 under the head of "Buildings," for the New Caddies and Rice Store referred to in the last Annual Report, and also R3,849·49 under the head of "Machinery" for Rapid Roller, &c., which it was found desirable to provide. Against the latter sum has been placed the receipt of R900 by the sale of an old Roller.

After making adequate provision for depreciation of Buildings and Machinery, as also for Commission due to the Superintendent on the year's working, a balance of R87,654·20 is shewn at the Credit of Profit and Loss Account. This sum includes R40,000 premium on the second issue of Shares, and R6,997·60 brought forward from the previous year's accounts. The Directors recommend that in terms of their Circular to the Shareholders dated 21st August last, the sum of R45,000 be applied towards the purchase of Caskieben, and placed to credit of an "Extension Fund" account. The Profit and Loss would thus be reduced to R42,654·20, out of which an interim dividend of 6 per cent. on the original Capital of R270,000 was paid on the 8th August, absorbing R16,200. The Directors recommend a final dividend of 9 per cent on the original Capital of R270,000, making 15 per cent for the year, and a dividend of 2½ per cent as provided for in their Circular of 12th October, 1896, on the second issue of shares of R80,000. These final dividends will amount to R26,300, leaving a balance of R154·20 to be carried forward.

The crops estimated for 1897 from the Company's estates amount to 323,000 lb. Tea against an estimated outlay of R90,206. The estimated profit from Rents and other sources is R2,500. In addition to the above expenditure the sum of R4,000 is allowed in the estimates for New Machinery, Lines, &c.

Mr. W. D. Gibbon having retired from the post of Inspector of the Company's Estates as from 1st January, 1897, Mr. A. E. Wright has been appointed to that office.

Mr. G. W. Carlyon having retired from the Board on his departure for England the remaining Directors elected Mr. Alex. Thomson to fill the vacancy. Mr. C. A. Leechman having also retired from the Board, Mr. A. E. Wright has been similarly appointed to the Directorate. In terms of the Articles of Association Mr. A. E. Wright now retires by rotation from the post of Director and is eligible for re-election.

Mr. R. L. M. Brown having resigned the post of Auditor to the Company, the Directors, under the Company's Article No. 92, appointed Mr. Hercules J. Scott to fill the vacancy thus occasioned. The appointment of an Auditor for the current year rests with the meeting.

By Order of the Directors,

WHITTALL & Co.,

Agents and Secretaries.

Colombo, February 20th, 1897.

THE RUANWELLA TEA COMPANY, LIMITED.

The annual ordinary general meeting of the above Company was held at the Company's Offices, No. 7, Queen Street, Fort, Colombo, 6th March, 1897.

The following is the directors' report:—

ACREAGE:

Tea in full bearing	313	acres.
,, ,, partial bearing..	25	,,
,, not in bearing	36	,,
Jungle and Waste land	199	,,
Total ..	573	acres.

The Directors beg to place before the Shareholders the Accounts of the Company for the past year.

The total crop secured was 153,828 lb., being 6,172 lb. less than was estimated. This was equal to 491 lb. per acre, and it was produced at a cost of R34,768·82 on working account, being at the rate of 22·60 cents per lb., which is slightly under the estimate. It sold for a net of R54,514·56, an average of 35·43 cents per lb.

A sum of R1,776·09 expended in manuring during November and December has been brought forward to this year's working account. The capital expenditure during the year has been R19,165·81 for new clearing, factory extension and new steam engine and boiler, against which has been credited R1,938 for proceeds of plants and old machinery sold.

After providing for Colombo administration expenses, Superintendent's Commission and writing off R2,000 for depreciation of buildings and machinery, as also R254·87 the balance of preliminary expenses, a net sum of R13 707·84 equal to 5·17 per cent on the total paid-up capital of the Company remains at the credit of profit and loss account, out of which the Directors recommend that a dividend at the rate of 5 per cent be declared, leaving R457·84 to be carried forward.

This disappointing result is mainly due to the low prices obtained for the Company's Tea, attributed to the insufficient Factory accommodation, the additions to which occupied an unexpectedly long time in completion. The desired accommodation has now been provided and ample machinery arranged for, and the Directors will not be satisfied unless a marked relative improvement in the prices obtained is manifest during this year.

This year's crop is estimated at 180,000 lb., equal to an average of 530 lb. per acre, costing 24 cents per lb. on working account, including R2,000 for manuring and a capital outlay of R8,160 on clearing and machinery is anticipated.

For the information of the Shareholders the Directors issue with this Report a copy of Mr. W. R. G. Hickey's last visiting report.

The Directors all retire from office in terms of the Articles of Association, and Mr. Eric S. Anderson, being about to leave the Colony, does not offer himself for re-election.

The appointment of an Auditor for the current year rests with the meeting.—By order of the Directors,

WHITTALL & Co.,

Agents and Secretaries.

Colombo, 12th February, 1897.

PERAK PRICES OF COFFEE AND GUTTA FOR FEBRUARY.

Coffee, $30 to $30.50 per pikul.

Gutta Percha, First quality, $130 to $180 per pikul.

Gutta Percha, Second quality, $50 to $110 per pikul.

White Gutta $50 to $60 per pikul.

India Rubber, $120 to $130 per pikul.—*Perak Government Press.*

NOTES FROM THE METROPOLIS.

February 12.

The lecture delivered one evening this week before the Society of Arts by Mr. David Crole on

"THE CHEMISTRY OF TEA"

was clearly not intended for general consumption, but rather for the instruction of probationers in chemistry. Mr. Crole is an Assamite, and the Indian element in his audience predominated as a matter of course. The lecturer began by deploring the fact that chemistry and kindred sciences had not bestowed as much attention on tea as on other products. With tea, he said, the advancement of knowledge had been chiefly made along practical lines, and science had been, till (broadly speaking) the present decade, very little requisitioned to help in the evolution of a more perfect system of cultivation and manufacture. His present object was to direct more general attention towards and stimulating research in this direction. These introductory sentences will serve to show the scope of Mr. Crole's paper. The audience were soon called upon to wrestle with passages of most elaborate and ear-splitting chemical definitions and descriptions, delivered with the ease of an expert by Mr. Crole, who also showed intimate acquaintance with the names of nume

rous products—"phloroglucin" and "para-di-hydroxybenzene," and many other sneeze-words which your correspondent confesses, he does not know how to spell. Indian and Ceylon teas, it was explained later on, possess more of both tannin and theine than China teas, but it would be wrong to infer from that fact that the consumer imbibed more tannin and theine with a cup of British-grown tea, for a larger quantity of China tea had to be put into the pot. China tea, said Mr. Crole, was lowest in theine, Japanese had a little more, and then came Java, Ceylon and Indian (in the order mentioned). Sir E. Stewart Bayley presided, and among the audience were Mr. G. W. Christison and Mr. A. G. Stanton. Though the tone of the lecture was severely scientific, a lively contributor to the *Daily Telegraph* manages to weave plenty of fun into a half-column report of the meeting. After romping about among the poets who have made verses out of tea, he winds up with the remark that it is bad enough to be frightened with "There is death in the pot", but it is worse to be intimidated with "There is 'cheesiness' in the chest"—from which it will be inferred that the lecturer had something to say as to the advantage of steel tea chests.

Among new Companies floated this week is

THE CEYLON PROPRIETARY TEA ESTATES COMPANY, LD.,

with a share capital of £160,000, divided into 40,000 £5 per cent cumulated preference shares of £1 each, and 120,000 ordinary of £1; 150 £5 per cent first mortgage debentures of £100 each have already been subscribed for. The directors are Mr. H. K. Rutherford, Mr. G. A. Talbot, Mr. R. A. Cameron and Mr. F. H. Wiggin (late Chairman, Beaumont Tea Company of Ceylon). Sir Wm. Johnston, Bart., is the Secretary. "The Company is formed," says the prospectus, "with the object primarily of acquiring as going concerns the following tea estates in Ceylon: the Beaumont Group (Pusselawa District), the Forres and Warburton estates (Maskeliya), the Summerville estate (Dikoya), the Troy estate (Kelani), the Radella estate, seven-eighth shares (Dimbula). It is estimated the 2,113 acres under tea will yield at the rate of 400 lb. per acre, or 845,000 lb. per annum, when all the acreage is in bearing. This, at 3½ per lb. profit, will give a return of £11,000 per annum, which is sufficient to pay the debenture and preference interest and a good dividend on the ordinary capital." The price to be paid to the vendors for the properties (subject as to the Beaumont Group, Forres and Warburton to £15,000 debentures or Beaumont Tea Coy. of Ceylon, Ld.) is £95,480, payable £71,376 in shares and £24,104 in cash.

CLUB ECHOES AND TEA LEAVES.

(*By an ex-Upcountry Resident.*)

London, February 12.

Last night, having failed to get a seat at Nansen's great meeting the evening before, I consoled myself with attending a lecture delivered at the Society of Arts, John street, by Mr. David Crole. The subject was

THE CHEMISTRY OF TEA,

and I have no doubt whatever that the lecturer himself understood all the jaw-breaking words and technical terms he used in the course of his address, but honesty compels me to admit they were far beyond *me*. I am the less ashamed of this confession, humiliating as it may appear, because at the close of the lecture one old planting hand after another stood up to acknowledge the same identical thing. The very Chairman—a K.C.S.I. no less—confessed himself baffled, and one experienced tea planter, whom I met afterwards, succinctly expressed the performance as the "most awful heathenish jargon" he had ever heard in all his days. The Latin inscription which Littleton of dictionary fame, composed for the Monument and which included the names of seven Lord Mayors in one word, was nothing to it. This was all the more to be regretted that Mr. Crole has evidently accumulated a vast amount of scientific information on the subject. In fact what this distinguished specialist does not know about tea, I should say is not much worth knowing, and if he had only had a little mercy on the less highly trained brains of his audience, all would have been well. A lecturer at any subject must cultivate a popular style if he wishes to be enjoyed by the man in the street.

But enough of criticism. Passing over the purely technical part of Mr. Crole's remarks, the outcome of his lecture was pretty much as follows: He altogether deprecated the rule of thumb system in tea planting and advocated more general attention to the scientific side of the matter. Much, he said, has yet to be discovered about what goes on in plant-life, and therefore details, which might be useful to the tea planter are as yet lost to him. (A table of analysis which Mr. Crole had borrowed from his own textbook on the subject of tea hung on the wall behind the lecturer and was frequently referred to. The list of substances displayed on it was truly formidable to an unscientific mind!) Bohea tannic acid, the chief form of tannic found in black tea belongs, the lecturer said, to the *non-greening* variety, "tea" tannic the characteristic form of the acid in *green* tea on the other hand being of the *non-blueing* class. When tea liquor remains in contact with the air for some days, the cloudiness that is apparent is due to a reaction between the tannic acid and the legumin, and the consequent formation of an obscure and insoluble compound, the astringency being decreased to a marked extent. This reaction accounts somewhat for the "mellowing" of tea that is kept for a time. Teas freshly manufactured produce unpleasant symptoms when drunk, therefore they should be mellowed for at least six months. *Thickness of liquor* or *creaming*, that quality so highly esteemed by tea tasters and buyers depends on the amount of mucilage present in the tea, and also in the action of tannin on *theine*. The amount of essential oil, *theol* in tea is variable, but it is a very important constituent, as its presence determines the greater part of the flavour aroma. Being volatile it is apt to be lost if the tea is exposed too long to the air. It is developed during the process of withering, and in the first stage of firing, but irrational firing may drive off a good deal of it by the steam generated in the firing. If proper attention, said Mr. Crole, were given to this part of the subject, he had no doubt the percentage of essential oil in tea might be greatly increased, and the quality of the tea consequently improved. It could be extracted from refuse tea, etc. by distillation by steam, but the great barrier is the seeming impossibility in keeping it, as it so readily resinizes in contact with the air. The more resin, the less essential

oil and the resins in tea being insoluble in water have no effect on the strength of the liquor.

In the manufacture of tea Mr. Crole spoke of the various mistakes that might be made by inexperience such as allowing the concentration of the sap in withering to go too far, which would prevent the cells bursting, impair the colour in fermentation and so forth ; the bruising of the fresh leaf which gave the air access to the sap during withering, causing consequently inferior quality and appearance of the tea ; the exposing of the tea to the direct rays of the sun, or to excessive temperature otherwise ; the allowing the rolled tea to lie about heaped up for any length of time, inducing a secondary fermentation, which last he ascribes to a living germ similar to that in the yeast plant, and desirable in the extreme to arrest at the very outset, its action being deleterious to the quality of the tea. Four points he laid great stress on :—1st, the leaf when withered and rolled, should be sieved to sort out the fine leaf from the coarse, as it is impossible to obtain an even fermentation if the two kinds are not separately dealt with.

2. A clean cement floor on which the leaf may be spread out evenly, not too thickly, and kept moist.

3. A dark cool airy room with a moist draught of air if possible.

4. The temperature of the leaf should be kept under 85° F. if possible.

After which Mr. Crole explained his theory that tea should be fermented under such reduced temperature as can only be obtained in a tea factory by the artificial use of a refrigerator, and added somewhat ruefully that having circulated this idea rather rashly a year ago, a machine had since been brought out forestalling his own invention on these lines. He has, however, gone on with his own and considers it embodies all the points his practical experience and scientific knowledge have suggested.

The disagreeable cheesy smell occasionally perceptible on opening tea chests, arrived at the docks, he attributed neither to the lead lining round the tea solely, nor to the green wood used in the boxes, but to both conjointly, and that some emanation of the green wood corrodes the lead, and then either itself, or its compound with lead, acts on some constituent of the tea. In steel chests, the remedy might be found, although of course that was merely a surmise. The foregoing is a summary of the more practical points in the lecture. What my boiling down of it loses in scientific language, I hope will be forgiven for the sake of everyday English which is perhaps more intelligible to the world in general.

In matters specially connected with Ceylon, perhaps the most noteworthy item of the week is the issuing of the prospectus of the new

TEA COMPANY.

The Company style themselves the Ceylon Proprietary Tea Estates Company, Limited, with a share capital of £160,000, divided into 40,000 £5 per cent preference shares, and 120,000 ordinary shares of £1 each. The Directors are: H. K. Rutherford, G. A. Talbot, of the Ceylon Tea Plantation Company, Limited, and R. A. Cameron, (Director, Eastern Produce and Estates Company, Limited), and F. H. Wiggin (late Chairman, Beaumont Tea Company of Ceylon, Limited). The Bankers are the Commercial Bank of Scotland ; and the offices of the new Company are in 21 Mincing Lane, E.C. The Company is formed with the objects of buying and working the Beaumont Group of estates in Pussellawa, the Forres and Warpurton estates in Maskeliya, the Summerville estate, Dikoya, the Troy estate, Kelani, and the Radella estate, seven light shares, Dimbula.

THE CHEMISTRY OF TEA.

(From the *H. & C. Mail*, Feb. 12.)

An interesting but highly technical paper on "The Chemistry of Tea" was read by Mr. David Crole at the Society of Arts on Wednesday evening. Sir Stewart Bayley was in the chair and in introducing the lecturer stated that besides being an expert chemist he had also been a tea planter in Assam.

Mr. Crole began by describing the various chemical constituents within the tea-plant and their action there so far as that action was yet known. The chemical constituents of tea make a list of most portentous names—tannic, gallic, and boheic acids; benzene, phloroglucin, oxyhydro-quinone. Meat tea, said the lecturer, was a horrible meal, dear though it was to the hearts of certain English folk, because the tannin of tea then taken into the system in conjuuction with albuminoid matter was converted into a leathery compound which took all the time of a powerful digestion to tackle. In fact, the meat tea meant dyspepsia. Besides theine the other alkaloids found in tea were theopylin, theobrimine, assumin, quercitrin, and some other undertermined ones, which the lecturer thought should be investigated.

Mr. Crole, after dealing at length with the chemistry of tea and its organic constituents, came to the question of the chemistry of the process of manufacture. He said :—

Whilst the leaf is withering little chemical change takes place, beyond an incipient oxidation of some of the constituents of the sap. Withering is brought about by the evaporation of a certain variable amount of moisture, but generally about one-quarter of the original weight of the freshly-plucked leaf. This loss of moisture occasions a concentration of the sap : if this proceeds too far, however, (1) the cells will not burst in rolling ; (2) some of the constituents of the sap will no longer remain in solution ; and (3) the colour during fermentation will be uneven, owing to there being insufficient sap to spread over the whole surface of the rolled leaf.

If the fresh leaf is bruised the air gains access to the sap during the withering process, and the tea is, in consequence, inferior both in quality of liquor and also in appearance, owing to decomposition and premature oxidation having set in.

If the leaf is exposed to a temperature which is excessive under the circumstances—as, for instance, exposure to the direct rays of the sun—an untimely oxidation will set in which will spoil the leaf for manufacture.

The object of rolling is to give a twist or roll to the leaf, and also to break the cells of the leaf and thus liberate the juices they contain, so that they may be further acted on during the next process, and also that they may be more capable of extraction with water.

On the cells being broken the sap escapes, and during the continuance of the rolling is spread all over the surface of the rolled leaf, where it is in a very favourable position for the oxygen to act on it during the next stage of manufacture—viz., fermentation. Some of this exuded sap is acted on by the hot air contained within the box of the rolling-machine, and in consequence a portion of the organic acids (chiefly the tannin) undergo partial oxidisation. Some of the tannin combines with the oxygen to form phlobaphene (Bamber), and also glucose and gallic acid, assuming a dark insoluble form during the process, while part also combines with some of the albuminoid matter, an insoluble, leather-like substance resulting. These two last reactions are only incipient at this stage, but are more fully developed during the next process (fermentation).

The next process, viz., fermentation, is the most important one from our present point of view—*i.e.*, the chemical aspect of the subject. Strictly speaking, it ought to be confined to a primary fermentation process (probably due to an oxidising enzyme); for if fermentation is further encouraged (by allowing the rolled leaf to lie about heaped up for any length of time, for instance) the tea manufactured from such leaf will be spoilt. In my opinion, this species of secondary fermentation and decomposition always begins to set in after the primary fermentation, or oxidation pure and simple, has proceeded far towards completion, and it is to forestall the secondary fermentation, more especially as well as to fix the primary fermentation, that the first stage of firing is mainly intended.

Mr. Bamber, who wrote on the chemistry of tea asserts that there is no fermentation at all during the process which popularly bears that name in the industry, and he bases his theory on several experiments in which he failed to discover any microorganisms; but recent research has shown that enzymes usually possess an oxidation action; and again, if the process is only an oxidation one, why is it of such extreme importance to "fix" it by the first stage of firing at the exact moment when the climax is reached? For the firing would not fix oxidation, by any means, but would strongly tend towards hastening and increasing it. Therefore, I think that there is every reason to conclude that the technical term "fermentation" is quite correct.

My theory is that the process commonly known as fermentation in the tea industry is, during a greater part of the time, at any rate, mainly an oxidation one, but that later on (it takes a little time for the microorganisms to develop and get to work), a fermentation due to an organism manifested by the peculiar rancid odour produced by overfermentation of a butyric nature begins to be set up, which it is desirable in the extreme to arrest at the very outset, since its action is deleterious to the quality of the tea.

Fermentation may be described as the splitting up of complex organic substances into simpler bodies, by means of either (1) living organisms, or (2) natural ferments or enzymes.

Living germs (micro-organisms) are responsible for such fermentative processes as are carried on by the yeast plant, or in sour milk, rancid butter, or when nitrogenous matter acts on sugar to produce gum.

The natural ferments or enzymes are named diastase (in malt), emulsin (in almonds), inverting (in yeast), pepsin, ptyalin, and trypsin (the active principles respectively of gastric, salivary, and pancreatic juices).

The primary fermentation that I have described as heing the only one to be encouraged in tea, is due to one of the second class (*i.e.*, a non-living ferment), whereas the secondary fermentation, which is the one to be discouraged, and arrested by firing, can with a good deal of certainty be ascribed to a living germ or organised ferment.

For the oxidation process to be accomplished properly the following points should be observed:—

(1) The leaf should be sufficiently withered and rolled, and then should be sieved to sort out the fine leaf from the coarse, as it is impossible to obtain an even fermentation if the two kinds are not dealt with separately.

(2) A clean, smooth cement floor on which the leaf should be evenly spread, not too thickly, and the leaf should be kept moist.

(3) A dark, cool, airy room, with a moist deaught of air if possible.

(4) The temperature of the leaf should be kept below 85 deg. F. if possible.

As regards the temperature at which tea should be kept during the oxidation stage, I have given what I consider is a minium temperature obtainable under ordinary circumstances in a tea-house in the plains; but I hold that a maximum of coolness during the operation, so as to protract it as long as possible (without, of course, reaching the point when the secondary fermentation is in active force), ought to be the aim in view, for reasons that will have been noted when reading the remarks on the formation and decomposition of various substances during the processes of manufacture. In fact, it would he well worth while to ferment teas under such reduced temperature as can only be obtained in a tea factory by the artificial aid of a refrigerator. I made this suggestion in my MS. of "Tea" over a year ago, but I was misguided enough to circulate it. Since commencing to write this paper I was apprised of the fact that a machine had been brought out somewhat on these lines; but as it did not altogether carry out my ideas I determined, without delay, on bringing out a machine myself embodying all the points that I found from a very extensive practical experience of and a large number of experiments with the fermentation of tea, were requisite.

One of the most importent chemical changes at this stage is an increased formation of essential oil, which it has been an aim in my machine to encourage.

The astringency of the tea is reduced by a further conversion of part of the tannin, to which this quality is mainly due, by a combination of part of the tanno-acids with some of the albuminoid matter, into a leathery substance which imparts the characteristic tough feeling to the leaf at this stage. These two last reactions usually commence during the rolling process.

A small quantity of the tannin is changed into gallic acid and glucose, and it would be a great advantage if more of it underwent this change, since gallic acid is not nearly so injurious to the human economy, when taken with albuminoid food, as tannin.

The pleasant aroma and nutty flavour of the leaf, so markedly developed during this process, are due to the formation of several volatile oils. It the process be too long continued, however, acids very similar to those present in rancid butter are formed, viz., butyric acid, &c. Prolonged firing will, of course, rid the tea of this disagreeable feature, but only at the expense of the greater part of the essential oil as well. This acidity, due to butyric fermentation, causes the coagulation of some of the albuminoid matter, which is ohiefly present in the form of vegetable casein (legumin), which is an alkaline albumen resembling the casein of milk. This coagulation is unfortunate, as it converts a valuable food material (which tea is very largely provided with) into an insoluble form, with the result that a large supply of nutriment is rendered useless. However, were it not already coagulated by the tannin, it would soon become so by the heat to which it would be subjected in the firing.

During the first stage of firing an increased amount of essential oil is freed by the bursting of the cells, and a further quantity is also formed by chemioal action.

Another action of this operation is to arrest the secondary fermentation—by which I mean that fermentation which, as I have already explained, begins to set in when the oxidation has about reached its critical point. It also removes about 40 to 50 per cent of the moisture from the half-manufactured tea.

Special attention should be paid to avoid most of the important volatile constituents being carried away and lost owing to the employment of too high temperatures and draughts of too great a force.

The concluding operation that tea undergoes in the factories where it is manufactured is, of course, packing; and with regard to this, I may mention that it not infrequently happens that when a wooden chest is opened, on its arrival in the docks, the tea is found to possess a very nasty, cheesy smell, which takes some time to completely pass off. For some time the only explanation for this rather disagreeable feature that was forthcoming was that the tea, under certain extraordinary circumstances, acted on the lead lining enveloping it. But although experiments were tried to produce this state of things artificially, no such aotion could be got to occur; and then a new theory was started, placing the whole

the boxes, the exudation from which has a corrosive action on the lead between the wood and the tea. However, this has not been actually established yet as the cause of "cheesiness." I have little doubt, in my own mind, that both reactions conjointly produce this objectionable occureuce, and that some emanation of the green wood corrodes the lead, and then either itself, or its compound with lead, acts on some constituent of the tea. Anyway this is a point that naturally turns one's attention towards the several kinds of steel tea chests that are now being exploited—*H. & C. Mail*, Feb 19.

In our last issue we gave a verbatim report of that portion of Mr. Crole's paper read before the Society of Arts which referred to the chemistry of the process of manufacture. It was the first portion of his paper which was especially technical. In dealing with this part of the subject Mr. Crole said that gallic or dioxysalicylic acid did not possess the deleterious property of precipitating albumen, gelatine, or starch, as tannin did, and since it was just as capable of imparting pungency to tea, it would seem a pity that a great deal more of the tannin was not reconverted into it. He would suggest that experiments be made in tea factories as to the effect of careful regulation of access of air and amount of heat applied during the operation of "firing" the tea, and that means should be tried to regulate the conversion and reconversion of gallic and tannic acids during the fermentation stage of manufacture. To tannin the pungency of tea was largely due— a valuable property from the commercial point of view. The origin of tannin in the plant was somewhat difficult to account for, but it would seem that it arose, at any rate in part, from gallic acid, though it must be mentioned that during the manufacture of tea some of it was oxidised back again into gallic acid and glucose by the action of a particular enzyme (pectase). From this last reaction it would be seen that tannin was a glucoside. When tea liquor remained in contact with air for some days a cloudiness was apparent which was due to a reaction between the tannic acid and the legumin, and the consequent formation of an insoluable and obscure compound, the astringency of the infusion being of course at the same time decreased to a marked extent. The reaction accounted in some measure for the "mellowing" of tea that was kept for a time. Freshly manufactured teas produced unpleasant symptoms when drunk, therefore, they should always be allowed to mellow for at least six months. A deleterious property of tannin was what it precipitated gelatine, and formed with albuminoid matter compounds closely related to leather. When the tannin of tea (or any of the tanno-acids) was taken into the system apart from albuminoid material it was quickly converted during digestion into glucose and gallic acid, the former being a useful food substance, and the latter at any rate less injurious than the original tannin. The amount of essential (volatile) oil in tea was variable. It was of great importance, as, though present in such small quantities, yet its odour was so strong that it imparted a major share of the aroma and a certain amount of the flavour to tea. Owing to those volatile properties tea loses its characistic delicate aroma if exposed to the air for any length of time. This constituent was developed to a certain extent during withering, and also during the first stage of firing. Through irrational firing, however, a good deal of it was driven off mechanically by the steam generated in the firing, or may be in part oxidised into resin. He was rather inclined to think that more than one representative of this class of compounds (viz., volatile oils) was present in tea. He had little doubt that, if proper attention were given to the subject, a very considerable increase in the percentage of essential oil would result, and the tea consequently be greatly improved in quality. It could be extracted from refuse tea, &c., by distillation with steam; but the great difficulty in the way was the seeming impossibility in keeping it, as it so readily resinised in contact with air. Coming to the nitrogenous bodies found in tea, the lecturer said that various alkaloids had been discovered, and he was persuaded that yet more would be revealed by future analysis. On account of the refreshing properties due to theine, all the plants in various parts of the world that elaborated it were used for making beverages. No doubt the value of a tea should be in direct proportion to the theine it contained, but Dr. Driver found, as a result of his analysis of twenty-eight samples, varying in price from 7d to 7s, practically no more theine in high-priced teas than in common ones; for instance, in a sample of *strong* (in the technical acceptance) tea he found 4·43 per cent of theine, and in a sample of *weak* tea, 4·35 per cent. The amount of chlorophyll present would seem to be actually a reliable index of the quality of black tea since it varied from 3 per cent in good to 1 per cent in common teas. What the consumer liked in tea was strength, body, and delicacy of flavour, but he carried what amount of theine he got, for he had no ready means of estimating the proportion present; yet, if he drank tea on account of its refreshing properties, he would do well to see that he got a maximum of the alkaloid which possessed this important characteristic. Plants which were able to elaborate certain alkaloids in one part of the world, either entirely failed to do so when transplanted to another part, or else only did so to a limited extent. The cocoa plant was a good instance in point. And it seemed that for this reason Chinese tea contained less theine than Indian teas. Chinese contained the least, Japanese slightly more, then Java, Ceylon, and Indian, in the order mentioned. It was popularly supposed that tannin was present in tea in inverse ratio to the amount of theine, but that was not borne out by analysis. Indian tea possessed more of both tannin and theine than Chinese teas, but it must not be inferred from that fact that the consumer imbided more tannin in the one case than in the other, for in household use more China tea had to be put into the pot than was the case with Indian tea.

DISCUSSION.

The following is the discussion which took place on Mr. Crole's paper, read before the Society of Arts, of which we gave a report a day or two ago:—

Mr. A. K. Donald desired to elicit the views of Mr. Crole as to the infusion of tea. He wished to know whether, if tea had water poured over it quickly, and the tea was then taken away, one would get a considerable proportion of theine and very little tannic acid, or whether, if it was infused for a long time, the proportion of tannic acid would not be increased, as compared with the theine. Further, he would inquire what effect carbonate of soda had if put into the water; did not that extract more tannic acid? It certainly produced a very peculiar flavour; and it has been stated in some books (particularly in Professor Johnston's "Chemistry of Common Life") that putting in carbonate of soda had the effect of getting out some albuminoids, and consequently making the tea more nutritious. It would be interesting to know whether Mr. Crole had any theory upon this point.

Mr. H. E. Bristow, referring to the statement of Mr. Crole that for the fermentation of tea a temperature of 85 deg. or less should be maintained, remarked that no mention was made as to the length of time of fermentation. He would like to know whether there was any method of fixing the proper time for the fermentation process to last; was it to be determined in any other way than by the colour of the tea?

Mr. T. W. Davies said the reader of the paper had spoken of the principle of tea as an essential oil. He would like to know whether Mr. Crole had had a sufficient quantity of that essential oil to test it so as to know whether it was really an essential oil containing an hydrocarbon; might it not be a volatile alkaloid after the character of, for instance, nicotine.

Mr. D. M. Stewart asked if Mr. Crole's attention had been called to the differences of the teas of different districts The remarks in the paper as to the cool temperature in which the fermentation should be

blame of the mischief on to using green wood for carried out led him (Mr. Stewart) to think of the difference there was between Darjeeling and almost all the Plains gardens in the matter of flavour. He had himself noticed, when in Darjeeling, that if a cool blast of air, such as was produced by a mist cloud coming down, went over a garden as the leaf was being plucked, as a rule the flavour was very much increased; that was what was known as the Darjeeling flavour. Mr. Crole did not seem to think that much change could take place while the leaf was growing, but this fact seemed to point in the other direction—that some change might take place whilst the leaf was growing, if there was a sudden change of temperature.

Mr. Crole, in reply, said that when tea is infused the theine is extracted very much more rapidly than the tannin. For that reason tea should only be infused for three or four minutes, in order to get the maximum of theine and the minimum of tannin; the tea-leaves should not be in the water more than four minutes. With regard to carbonate of soda, its action was, in the first place, to soften the water, thus allowing more of the flavouring matter to be extracted. Another prominent action was to diminish the astringency of the tea by neutralising, and even preventing, the solution of the tannin. He did not think it had any other action on the constituents of tea. He did not know what ruled the time of fermentation. In one garden it might be that eight hours' fermentation would be required, while the next, separated by only a fence, would not want more than two hours. The difference was probably due to soil and jât of tea. But he thought that teas should always be fermented according to their colour and smell, and not by any time method, unless, of course, they were fermented in a refrigator. What the effect would be of a cold cloud while the leaf was being plucked he could not say; but undoubtedly a certain amount of cold during the process of fermentation was a great advantage. It was inexplicable to him that, while the tea was growing or being plucked, a cold cloud or cold blast should bring out the flavour, but he could understand that that might be the fact. Mr. Davies had spoken with regard to the essential oil in tea. There was little doubt that it was absolutely an essential oil; but there were other alkaloids, of course, in tea, and some of them had not been determined. He was himself working at the determination of one of them—not associated with the essential oil of tea, but with what was called boheic acid—and he thought he would be able to get an alkaloid from that. As he stated in the paper, boheic acid was probably not a single organic acid, but a compound of assamic acid either with another acid or with an alkaloid.

The Chairman, in moving a vote of thanks to Mr. Crole, said he was not capable of judging of the excellence of the paper from the technical and scientific point of view, but it contained some advice which he was quite sure was most useful and valuable, and which he hoped would be taken to heart. It was impossible to doubt, as was stated in the paper, that so long as the tea manufacture and similar manufactures were worked by mere rule of thumb, so long would the manufacturers fail to get the best that was to be got out of their products. Their experiment was tried in Assam, for a short time, of having a chemist to help the planters generally in the process of manufacture. He had not heard what became of the experiment, but he believed it had not lasted for any length of time. It was one which, of course, could not succeed unless kept up for a number of years together; and it required an expert who should be well paid, and who would confine his whole time and labour to the study of chemical questions. He was sure that, both in the maufacture of tea and in the manufacture of indigo, such an experiment would pay the planting community over and over again. With regard to the remarks made in the last paragraph of the paper as to the cheesy smell of tea on arrival at the docks, that was an old question in Assam He remembered that years ago there were endeavours to get rid of it by changes of boxes or by inquiries as to the chemical action on the lead, but nothing effectual had come of them. Concluding, the chairman said he was only expressing the unanimous feeling of those who had heard the paper in offering Mr. Crole their very best thanks.

Mr. Christison said: As the chairman had done him the honour of calling upon him to contribute to the discussion, it might seem ungracious on the part of one who had been so long connected with the production and manufacture of tea, unless he stated that it was not the want of interest in the subject or of will that made him diffident in rising. He thoroughly agreed with the chairman as to the vast importance to the tea-planting industry of having scientific assistance. So important an industry ought to employ scientific experts continuously; but great care must be taken to engage those most suitable and competent for the necessary investigations. He felt that as the paper was of so technical a nature he was not competent to express any opinion as to its merits. In reference to the least scientific portion of it, which treats of the chemistry of the process of manufacture, if the opinions expressed on the more practical points are deductions from Mr. Crole's independent scientific investigations, all that he could say was that, so far as they go, they tend to confirm the commonly approved practice in the tea districts, and what has been that practice for a very long time. Though on the technical points he was not in a position to speak, he had no hesitation in saying that thanks were due to Mr. Crole for devoting himself to scientific research on a subject too little studied or even thought about. The publication of this paper could not fail to lead to further discussion and research with good results.

The resolution was carried unanimously and Mr. Crole having briefly responded, the meeting terminated.—*H. and. C Mail*, Feb. 19.

VARIOUS PLANTING NOTES.

Tea Duty in Denmark.—A merchant writes:—"Can you tell me what the duty is on tea in Denmark. I have applied to the Danish Consul, and he doesn't know." In our Handbook and Directory for 1895-6, we gave a list of countries with the duty levied on tea in each. In that list Denmark is down for "3d"; but we believe there has been an increase since; for we find the Danish duty given at 4d in a London authority for this year.

Handbook of the Flora of Ceylon.—This great task, which Dr. Trimen set himself to elaborate, was to have been completed in four volumes, the third of which was issued in 1895. It was to complete the fourth volume that the late lamented Dr. Trimen went back to Ceylon, in spite of the shattered state of his health. Sad to say, he was unable to accomplish this before the end came. When he was no longer able to sit up to work, the indefatigable botanist did so lying on his back. Of the 3,000 species native to the island, about 800 still remain to be tackled. They consist chiefly of grasses and Orchids. It is believed in Ceylon that the completion of the fourth volume may take place at Kew under the direction of Dr. Thistleton Dyer. Dr. Trimen had a good many years' local experience before he commenced his *Flora*, and it is much to be regretted that he did not live to complete it. His name will, however, be always identified with the botany of Ceylon. Mr. Willis, the new director will have his hands full with the duties of his office for some time.—*Gardening World*, Feb. 13.

TEA PLANTING AS A PROFESSION.

This is the age of competitive examinations, and year by year the standard of knowledge required to pass them successfully becomes higher. They are the door through which most professions are entered, and, says *Hearth and Home*, the tendency is to introduce them in many where formerly totally different methods prevailed. Year by year it becomes harder to provide for boys who have no taste for brain-work, and who, although in full possession of their faculties, cannot attain the high standard of learning wherewith we must now be fortified to pass even the simplest of tests. In England itself there are very few openings in which headwork is not required. India and the Colonies offer a larger field, which unluckily is daily becoming a smaller one. In most colonies such work is of an arduous nature, only fitted to be undertaken by the most robust, who have to work harder than day-labourers at home; but in the East, where the menial work is done by natives, there is less toil, combined with a greater degree of comfort, and good health, although an important point, need not be of the powerful order which is imperative for the settler "out West," or in the newer settlements of Australia. Of openings in the East, tea-planting perhaps offers the greatest inducements and best prospects to boys who like an outdoor life and cannot pass the examinations necessary for appointments in Government service. "But isn't the profession terribly overcrowded?" parents ask. Of course it is, but so is every other desirable profession under the sun. Planters (who do not at the moment require pupils) will tell you that it is terribly so, and that the prospects of tea are distinctly bad; but this statement must be taken with a grain of salt; it is only comparative, and nine men out of ten will tell you their own particular profession is in the most hopeless state of any.

The prospect of a successful career as tea planter is, it must be allowed, not very good, if the boy has to make his way on his merits alone, unbacked by capital. In this case he will rarely attain a greater eminence than the position of manager (and this is not to be despised), but if after his period of probation, when he has thoroughly mastered the intricacies of tea planting, he can command a sum to invest in a small estate, or to buy a partnership, it completely alters the matter. Statistics tell us that the consumption of tea, despite doctors, is greatly on the increase, although planters no longer amass the fortunes of former days a very fair competence may still be made in their trade, and a very comfortable life may be led. Most planters take pupils, thereby adding a considerable sum to their incomes, and at present this is the only school in which the would-be planter can graduate. The greatest caution must be exercised in selecting a person with whom to place the pupil. The choice of a place, too, is another very important matter, as the climatic and social conditions of the various tea districts vary greatly. Ceylon certainly takes the lead of tea-growing districts in point of desirability, its balmy atmosphere and beautiful scenery making it an ideal residence (it is one of the three sites of the Garden of Eden), while its luxuriant vegetation makes the cultivation of all manner of crops an easy matter. A planter's life is by no means an idle one, passed in lazily enjoying the profits of black labour, as the pupil soon discovers.

Work, hard and continual work, albeit there is no actual manual labour, from early morning till short, tropical twilight, gives place to night, is the secret of successfully conducting of tea plantation. Before sunrise, after an early cup of coffee, the owner is up and making a tour of inspection around the estate, seeing that the Tamil coolies, men and women, are at their work among the sweet-smelling tea shrubs and slender white-flowered cinchona trees. Constant supervision is required wherever Oriental labour is employed. In the heat of the day, travelling over the sunny, treeless paths, even when protected by a solar tope, is trying. Then the accounts of the estate have to be carefully kept, the state of the markets studied, and a vast amount of correspondence to be got through. Shrewdness and the power of calculation are highly necessary qualities, for the success of the crops in a great measure depends upon a thorough knowledge of the weather and the conditions of the soil. When the pupil has finished his novitiate in tea planting he will, if he has capital, buy a share in some estate, possibly the one whereon he has lived; but if not possessed of money he will have to content himself with the position of manager or overseer. The pay given to these varies considerably, according to the size of the estate, but a very usual rate is from R300 to R500 per mensem, with a bungalow included. It will be seen from this that the pay is not high but living is cheap, and the axiom that "Man wants but little here below" is realised in the tea districts of Ceylon.—*H. and C. Mail*, Feb. 12.

IMPORTATION OF DUTIABLE GOODS IN PACKAGES OF TEA.

The Treasury Department has information to the effect that a practice prevails among foreign shippers of tea, intended for this country, of placing dutiable goods in the same packages with tea, such as paper bags, chinaware, transparencies, etc., which are to be used as gifts to retail purchasers.

The above practice is held to be unlawful under the tariff laws, inasmuch as it prevents a proper examination of the goods and facilitates frauds upon the revenue.

Instructions regarding such importations have been issued to the Collector of Customs at all ports of entry, ordering the retention of all packages of tea containing other merchandise. The original order was as follows;—

Treasury Department, Office of the Secretary,
Washington, D.C., Aug 21, 1896.

Collector of Customs, Port Townsend, Wash:

Sir,—The Department has received your letter of the 4th inst., inclosing a communication from your deputy at Tacoma, in which he calls attention to an objectionable practice which is in vogue among certain importers of tea. The practice he describes is the placing in each chest or box of tea of a piece of porcelain ware, intended, as he presumes, as a gift to the purchaser.

Although this mode of packing is not expressly interdicted by the law, it is fraught with such danger to the revenue and such labor to the customs officers as make it inadmissible. The Secretary of the Treasury has, under the Statutes (R.S. 2949), authority to make rules and regulations, not inconsistent with law, to secure a just, faithful and impartial appraisal of all merchandise imported into the United States.

You are therefore instructed to retain possession of packages of tea containing other merchandise, as above described, and to notify all persons concerned that no such packages will be admitted to entry except for immediate exportation.

You further call attention to the new method of putting the contents of boxes of tea into small papers, and you point out the difficulty of deciding upon the nature of teas so put up, unless every package shall be opened and examined.

The practice last described is not held to be fraught with danger to the revenue, and therefore is not forbidden. You are advised, however, that a thorough scrutiny of tea so packed should be made, even if it sometimes necessitates the opening of every paper package in a chest.—Respectfully yours,

CHARLES S. HAMLIN,
Acting Secretary.

—*American Grocer*, Feb. 3.

THE SOUTH WANARAJAH TEA ESTATES, LIMITED.

A copy of the prospectus of this Company has just reached us. The share capital is £100,000, divided into 5,000 cumulative six per cent. preference shares of £10 each and 5,000 ordinary shares of £10 each.

The Directors are Matthew P. Evens, Director of the London Commercial Sale Rooms, Limited, Chairman. Hamilton A. Hancock (Haucock Brothers & Co.), 28, Mincing Lane, E.C. Thomas J. Lawrance, Director of the Ceylon and Oriental Estates Company, Limited. Oswald C. Magniac, Hay's Wharf, Tooley Street, S.E. Managing Director in Ceylon.—W. Reeve Tatham, South Wanarajah Estate. Being interested as the Vendor, will not vote as a Director until after the completion of the sale. Solicitors.—Harwood and Stephenson, 31, Lombard Street, London, E.C. F. J. and R. F. de Saram, Colombo. Bankers.—The National Bank of Scotland, Limited, 37, Nicholas Lane, E.C. Head office in Edinburgh, and Branches in Scotland, the Chartered Bank of India, Australia, and China, Colombo. Auditors.—Fuller and Wise, Chartered Accountants, Portland House, Basinghall Street, E.C. Secretary (*pro. tem.*) and Offices.—P. E. Harvey, 39, Lime Street, E C.

This Company has been formed to acquire as going concerns the two tea estates known as South Wanarajah and Dartry, situated in Ceylon, and to acquire, carry on, and purchase other estates in Ceylon as favourable opportunities occur, the unissued capital being available for that purpose.

The total area of the two estates is 713 acres, viz. :—

467	acres tea in full bearing.
46	,, ,, in partial bearing.
29	,, ,, 2 to 3 years old.
17	,, ,, 1 to 2 ,,
21	,, ,, under 1 year old.
580	
41	,, cocoa and coffee.
71	,, grass and timber.
21	available for tea.

Total..713 acres.

It is intended to acquire the Dartry Estate as from 1st January last, and the South Wanarajah as from 1st July next.

Taking a full year's estimated revenue, the profit derivable from both properties should be considerable, as shown herein, and after providing for the interest on the present issue of Debentures and the Dividend on the present issue of Preference Shares the balance should be sufficient to afford a handsome return upon the Ordinary Shares.

As 46 acres are still only in partial bearing, and 67 acres are still too young to pluck at all, it will be seen that the output of made tea should considerably increase without further extensions, and, therefore, it is confidently believed that there will be a very considerable addition to the profits of the Company in two to three years.

South Wanarajah is situated in the Dikoya district, 4 miles from Hatton Railway Station, and has the Government cart road through the property. The buildings, which are sufficient for all the requirements of the estate, include a well-built bungalow, ample line accommodation for the coolies, and a new and substantially-built brick factory, equipped with all necessary machinery of the latest type for the present and future requirements of the estate. The motor power is a turbine fed by an abundant supply of water from the river Dikoya.

The Dartry Estate is situated in the District of Gampola, and is only 1½ miles from the Gampola Railway Station, and has a private cart-road from the factory to the Government road, which facilitates and ebeapens transport operations. This estate enjoying as it does a perfect climate for tea, and the command of ample labour supply from the villages adjoining, may be said to possess great advantages which cannot be too highly estimated. The property has moreover been opened in a most liberal manner, and planted with Tea of the best jat. The buildings are substantial, consisting of a manager's bungalow, two conductors' bungalows, and sufficient line accommodation for the coolies. The factory is well equipped with machinery for all the present requirments of the estate. The motors are a turbine and an oil engine, the latter being used when the water runs short, as it usually does during one or two months of the year.

The Vendor's estimates of crop from the estates for the present season, say from 1st January to 31st December, 1897, are as follows :—

Tea, 3000,000 lb. at the low price of 6¼d. per lb nett (as against 6⅝d. per lb. for last season)		£7812
Tea Seed, &c		800
		8612
Ceylon working expenditure ...	£5000	
Depreciation of machiuery, London charges, Directors' and Auditors' Fees &c.	462	
		5462
		3150
Deducting—		
Debenture Interest.. ..	900	
Preference Share Dividend ..	60	
		960
A balance of		£2190

is left available for Dividend on the present issue of Ordinary Capital of £18,000.

The price to be paid by the Company for the purchase of the estates and properties including all the dead and live stock (except the furniture and personal effects), free from incumbrances, except as to a mortgage on the South Wanarajah Estate for Rupees 55,000, or say at 1s. 3d. exchange £3437 10s. 0d., has been fixed by the Vandor at £33,000, payable as to £23,000 in cash, and as to £10,000 by the allotment of 1000 fully-paid Ordinary Shares of £10 each, which will rank for dividend as from 1st July next. Taking the price of the uncultivated and reforested land at £10 per acre, the price of the land under Tea, Cocoa and Coffee, including all the buildings factories, and machinery thereon, is about £57 per acre.

Mr. W. R. Tatham the Vendor, who has had a long experience as a Ceylon Planter, has agreed to act as Managing director during the term of ten years.

The Vendor will pay all the expenses of and incidental to the formation and registration of the Company up to the first general allotment of of Shares, and will convey the estates to the Company free of expense.

PLANTING AND PRODUCE.

The Tea Duty Question.—In a letter which appeared in our last issue a correspondent, "Planter," drew attention to the qnestion of the reduction or abolition of the dnty on tea. In our opinion the advantages of such a fiscal step are obvious. It would benefit all who are concerned in the industry. The producer would gain by it on account of the increase of consumption which would inevitably follow, and also because it would strike an effective blow at the evils that attend the Customs' supervision of tea imports in the bonded warehouses. The contention that duties keep up the quality of teas is, we believe, a fallacy. It is the character of the soil and natural conditions and surroundings that determine quality. It cannot be doubted that the consumer would hail the advent of abolition with great satisfaction. Nothing was more popular with the masses than the reduction of the tea duty effected by Mr. Goschen when he was Chancellor of the Exchequer in the first Unionist Administration. In fact, so gratifywas that policy from an electioneering point of view that it is probable the present Ministry, should they some day find it necessary to appeal to the country, will resort to a similar expedient to revive their apparently waning popularity with the labouring classes, as evidenced by the recent bye-elections. In-

direct taxation is distasteful to the public, particularly when it affects anything in the shape of feed or drink. Much sympathy was evoked at the Romford and Walthamstow elections by Opposition orators pointing out how much more useful it would have been to have taken off the duty on tea and similar articles of universal consumption than to have drawn on the national exchequer for the relief of agricultural rates.

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Unfair Incidence of the Duty.—Another aspect of the question which weighs with the public is the unfair incidence of the duty. duty. As "Planter" points out, on quality teas the duty is just half as much as it is on common teas, which is a manifest hardship to the average consumer. Tea planters unacquainted with the ins and outs of home politics have no idea of the large part that this question of taxing tea plays in rural politics and in the political discussions always going on in the poorer urban districts. "Planter" has patriotic compunctions as to the advisability of abolishing the duty altogether on the ground that in the event of war it might be expedient to rise the revenue by increasing the tea duty. But as it is generally admitted by both parties in the State that the burdens of taxation should be imposed on the persons best able to bear them, no Government would be likely to put a tax on food or kindred substances, that falls most heavily on the masses, while there was an income tax to screw up, which mainly falls on the well-to-do minority. As to putting differential —much as Indian and Ceylon planters may desire it —duties on China teas, that proposition, however plausible in theory, is not within the range of practical politics. No Chancellor of the Exchequer would entertain the idea at present; Sir Michael Hicks-Beach, who is one of the staunchest of Free Traders, least of all. British enterprise and the hold British-grown teas have on the community are the best safeguards against China competition. We do not believe ourselves that the consumption of tea has reached its limit, as some aver. The tendency of the times in all ranks of society is to eschew the cup that inebriates and to drink more and more tea. This tendency, if it be condemned by the medical faculty occasinally, is still growing, for all classes of the community are fond of tea, and believe that, in spite of the evils of dyspepsia which are supposed to wait on those who drink too much, there is nothing yet known which compares with tea as a comforting and invigorating drink.

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Tea Planting and Matrimony.—The columns of *Truth* are usually open to grievances of all kinds, either at home or from India and the Colonies, but there are some problems rather too wide and deep even for *Truth*. We recently touched upon the subject of planters and matrimony, admitting, however, that it was rather a large order. The editor of *Truth* evidently thinks so too, for he says: I am desired by an Indian tea-planter to help in correcting the mistaken notion which prevails in many quarters at home respecting the class of young men who are required in the tea industry. The idea seems to be that any ne'er-do well or noodle will be good enough for a berth on a tea garden in India or Ceylon, and owing to the foolish complaisance of directors of companies and owners of estates in yielding to the influence of relatives and friends, such youths are often sent out. The business is really one, however, in which a special scientific training is demanded, and directors who foist on to an estate incompetent young fellows with no knowledge or aptitude for the work do themselves and their shareholders a very bad turn."

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The Labour Question.—*Truth* touches upon another matter affecting tea planters, for in the same issue as the above the editor says: "A new phase of the coolie recruiting question is brought out in a letter that I have had from a tea planter at Sibsagah, in Assam. He frankly admits that under the system of so-called 'free emigration' from Chota Nagpur, coolies are brought and sold like cattle. Nor does he deny that atrocious cruelty is practised in connection with the traffic; but he says that these iniquities occur in the recruiting districts, where the planters are powerless to stop them, and that once the coolies get to the tea gardens they are well treated. The special point of view from which he writes, however, is the high price which employers in Assam now have to pay for these "free emigrants." Formerly a planter could send forth one of his own garden sirdars as a recruiter, and rely upon his bringing back twenty or thirty or more adults, at a cost of from R35 to R50. Now the supply of such labour from Bengal is almost wholly in the hands of coolie contractors, and these middlemen make the planters pay from R100 to R150 for each adult delivered in Assam. One result of the high prices is that a strong inducement can be held out to men to abscond and enlist over and over again, the dealer in coolies making a good profit for himself each time. My correspondent's proposed remedy for a state of things which he plaintively declares is becoming unbearable seems to be a combination among owners of tea estates to boycott the coolie contractors, and run the recruiting business on their own account, though under the supervision of a Government officer' This would be a very good move for the planters, but whether it would be sufficient to put an end to the abominable abuses which exist in the recruiting districts is exceedingly doubtful. What is wanted is a root-and-branch reform, if not the abolitiou of the whole system, which at present is nothing less than a legalised slave trade."

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The Chemistry of Tea.—Mr. David Crole, whose book on "Tea: a Text-book of its Cultivation and Manufacture," will be published shortly, read a paper on "The Chemistry of Tea" at the Society of Arts on Wednesday. The paper, a portion of which we publish in another column, was a very technical one, and as there were few among the audience who had made a special study of the chemistry of tea the discussion on the paper was necessarily brief, although the chairman called on Mr. Christison and other gentlemen who have had practical experience of tea manufacture to take part in it. We have not space to reproduce Mr. Crole's elaborate and carefully prepared exposition of the chemical constituents of tea, but we reproduce the more practical portion of his paper dealing with the chemistry of the process of manufacture. As the chairman of the meeting stated, the whole subject of the chemistry of tea requires investigation, and Mr. Crole's paper should help to stir up interest in the subject.

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Rather Too Popular.—At a time when there are complaints that the "creeper" system is overdone, and that tea planting as an occupation for young men in search of employment and adventure is overstocked, the appearance of articles in family papers on the popularity of tea planting are not so welcome as they otherwise might be. We reproduce elsewhere an article on "Tea Planting as a Profession" from the pages of *Hearth and Home*. It is not a highly-coloured picture of the prospect, but it is calculated perhaps enthuse young men with a desire to go tea planting before they have ascertained the difficulties which are pretty certain to overtake them in the pursuit of a likely opening. Unless a young man has first passed some time in an engineer's shop and mastered the rudiments at least of mechanical engineering, to say nothing of agricultural chemistry, and has rendered himself fit for the tea garden, he is of no practical use, and has everything to learn. If he has done all this he has still to find a vacant berth where his rudimentary knowledge will find scope for expansion. Under these circumstances the choice of climate and the attraction of the life need not fill too large a place in his mind. Of young men on the look out for billets on tea gardens there are enough and to spare; therefore, unless new comers are physically and mentally fit and speci-

ally qualified generally there is no room for them in India or Ceylon, and they will do better by staying at home. We quite admit that the question what to do with young men whose education has been costly and who aspire to any kind of life which takes them abroad is one of the problems of the day. Even for the stay-at-home studious youth it is perplexing. All the professions are overstocked, and it is only the young man with remarkable qualities and indomitable pluck and perseverance who is likely to succeed in any walk of life unless it be by a fluke. But tea planting, as we have said, is also overcrowded, and therefore it offers no field for candidates from home who are not specially qualified. It is not sufficient that the aspirant for a tea planter's creer should have free and easy manners, no spcial love for work, and no particular fitness for anything but routine life. India and Ceylon are intensely like other places in that these human products are not necessary to the welfare of the regions. Waiving the question of the outlook, even to a qualified young man, with tea planting offers if he have not capital behind him, it is clear that the market for tea assistants is over supplied, and that rose-coloured views on the subject of the prospect offered are doomed to disappointment.—*H. & C Mail*, Feb. 12.

ON THE RIGHT TRACK.—The importance of opening up and supporting new market for Indian and Ceylon tea has now become generally recognised. For some time past we have repeatedly drawn attention to the matter, and it will be remembered that at nearly all the general meetings of the tea companies last summer this fact was specially emphasised. In turning to the results that have already been achieved it is gratifying to note that, so far as North America is concerned, the quantity of British-grown tea taken during 1896 shows a considerable increase on previous years. From statistics compiled by Messrs. Gow, Wilson, & Stanton, we find that the quantity of Indian tea was 5,202,405 lb, compared with 4,059,595 lb. in 1895, and 2,428,230 lb in 1894. The figures for Ceylon tea are as follows: 1896, 4,268.614 lb; 1895, 3,735,590 lb; 1894, 2,295,140 lb. "Well begun is half done," and it must be admitted that these results are highly satisfactory, and should prove a great stimulus to future efforts. It must, however, be borne in mind that the task is by no means complete, and that it is only by united action on the part of the Indian and Ceylon planters in supplementing the efforts of Mr. Blechynden and Mr. Mackenzie by raising as large a levy as possible, and other means, that it can be accomplished. —*H. & C. Mail*, Feb. 19.

TEA PACKING.

Necessity is the mother of invention. We note that the prolonged depression in the Welsh tin-plate trade has caused those interested in that industry to seek fresh fields of enterprise for the disposal of their produce. The Tin-plate Manufacturers' Association of South Wales have awakened to a sense of the wide field which Indian and Ceylon might afford for the utilisation of tin-plate for tea packing purposes. Several meetings have been held in the district to discuss the project. At these meetings the fact was pointed out that only 2 per cent of the tea imported into this country is packed in metal cases, and a determined effort was expressed to win the remaining 98 per cent for the trade of the Principality. Voluminous correspondence has appeared on the subject in the Welsh newspapers. Large dealers in the metropolis and elsewhere have been consulted, and an expert was invited to read a paper on the question by the Association.

The objections of some tea importers to tin as compared with wooden chests were, of course, trotted out at the meeting referred to. One ridiculous objection was that tin fatally debarred any sort of ventilation, and led to the following correspondence in a local newspaper: A correspondent signing himself "A Well-known Local Grocer" wrote: "Tin will never do. You know that they when stacked often causes sufficient heat to cause a blaze. Well, unless some outlet for the damp contained in tea is provided it will all go wrong. Of course the air cannot get to it to give it sufficient oxygen for a fire, but the result with air-tight tin boxes will be that the tea will get heated, then mildewed, and spoilt. Under the present arrangement the leadfoil-lining of the wooden boxes, not being hermetically sealed, allows the hot air to get away through the wood, and the tea arrives here quite sound and wholesome. It is my firm belief that it would not do so were it to be packed in sealed tin boxes."

The foregoing epistle elicited the appended reply from a leading Cardiff business man, who had for fifteen years been a tea planter in one of the most prosperous districts in India: "I read with astonishment the opinion of 'A Well-known Local Grocer.' I should like to know this man, as such ignorance of a subject in which one would naturally suppose a grocer to know a little is deplorable, and I would be loth to accept him as a representative of his trade. Tea is and must be packed in hermetically-sealed chests, otherwise (considering the extraordinary power of absorbing moisture which tea possesses) 'the sea will get heated, and then mildew and spoll.' 'A Well-known Local Grocer' will be surprised to hear that before the tea is packed it is refired, and every particlef of moisture withdrawn; it is put into the chests hot, and immediately the lead is soldered down and hermetically sealed. Great care is also taken by the planter in nailing on the wood top, in case eve a nail should be driven carelessly and perforate the lead, and thus spoil the air-tight case in which the tea is enclosed." According to the value opinion of Mr. Christison, whose paper on tea planting read before the Society of Arts dealt with this subject, unsoldered cases as received by grocers and warehouse methods have something to answer for.

As to the superiority or inferiority of tin cases to lead-lined wooden boxes for tea packing purposes, we must leave that controversial point to be settled by planters, contenting ourselves with drawing attention to the activity which is being displayed in the tin centres of South Wales to meet the requirements of the tea industry.—*H. & C. Mail*, Feb. 19.

CEYLON PROPRIETARY TEA ESTATES COMPANY, LIMITED.

From the prospectus of this Company which we mentioned had been formed with a capital of £160,000, we quote as follows:—

This Company is formed with the object primarily of acquiring as going concerns the following tea estates in Ceylon:

The Beaumont Group (Pussellawa District); the Forres and Warburton Estates (Maskeliya); the Summerville Estate (Dikoya); the Troy Estate (Kelani); the Radella Estate, seven-eighth shares (Dimbula), and of purchasing other properties when favourable opprtunities offer.

The following are the total acreages of the properties (subject to the reduction of one-eight, in the case of Radella estate, for the purchase of which negotiations are in progress.

Estates.	Approximate Mean Elevation.	Tea in bearing.	Tea in partial bearing.	Reserve and Waste.	Total Acreage.
	Feet.	Acres.	Acres.	Acres.	
Beaumont Group	3,000	608	189	393	1,190
Forres and Warburton ..	5,000	380	—	9	389
Summerville ..	3,800	200	—	37	237
Troy ..	300	326	—	145	471
Radella ..	5,000	410	—	186	596
Total Acres ..		1,924	189	770	2,883

The properties are freehold, with the exception of 75 acres of tea and 5½ acres of uncultivated land on

the Beaumont Group, held on lease, under which there is an option of purchase for part of the acreage.

It is estimated the 2,113 acres under tea will yield at the rate of 400 lb. per acre or 845,000 lb. per annum, when all the acreage is in bearing. This, at 3½d per lb. profit, will give a return of £11,000 per annum, which is sufficient (after allowing for the one-eighth share in Radella estate not yet acquired), to pay the Debenture and Preference interest and a good Dividend on the Ordinary Capital.

The estates are intended to be taken over as and from the 1st day of January last, and the price to be paid to the Vendors for the properties (subject as to the Beaumont Group, Forres and Warburton to £15,000 Debentures of the Beaumont Tea Company of Ceylon, Limited, hereinafter referred to) is £95,480, payable as to £71,376 fully paid Ordinary Shares, and 20,000 fully paid Preference Shares, and as to the balance, in cash.

Allowing £5 per acre for the value of the uncultivated land, the purchase price of the land planted with tea, including buildings, factories, machinery, &c., is at the rate of £51 13/- per acre,

After payment of purchase money the present issue of Shares will provide £6,520 available for preliminary expenses and working Capital, and also for the proposed additional purchase of land.

The Preference Shares will be entitled to Cumulative Dividend of five per cent per annum, and will take priority both as regards Dividend and Capital over the Ordinary Shares.

The £15,000 Debentures will be secured by a First Mortgage in favour of Trustees on the Beaumont Group, Forres and Warburton Estates, and are intended to replace an equal amount of Debentures of the Beaumont Tea Company of Ceylon, Limited, which are charged on the same Estates, and which the Ceylon Proprietary Tea Estates Company, Limited, is to get in and cancel.

The terms of purchase of the Beaumont Group of Estates and Forres and Warburton Estates are contained in a letter from the Directors of the Beaumont Tea Company of Ceylon, Limited, to H. K. Rutherford and R. A. Cameron, dated 31st December, 1896. and telegrams dated 18th, 22nd and 24th January, 1897.

The terms of purchase of Summerville and Troy Estates are contained in an agreement ma'e the 5te February, 1897, between Mary Elizabeth Evelyn Elwes, Violet Lucy Elwes and Arthur H. L. Elwes of the one part, and the Ceylon Proprietary Tea Estates, Company, Limited, of the other part.

The terms of purchase of seven-eighths of Radella Estate are contained in letters from Francis Holme Wiggin to R. A. Cameron, dated 1st, 7th, 15th, 23rd and 31st December, 1896, and telegrams of 18th, 22nd and 24th January, 1897.

ASSAM AND INDIARUBBER.

Those who know Assam believe that nearly everything can be produced there. The exceptional demand for rubber at the present time lends additional interest to the accounts of the rubber output from Assam. This amounts annually to about 3,500 mounds (about 128 tons) worth in Calcutta R3,50,000 (£35,000). This includes, beside the rubber produced in the province, in the plantations and reserves, the "foreign" rubber collected and brought from the interior by the natives. It is estimated that, from the latter source, a supply to the extent of 900 to 1,000 maunds per annum may be kept up for five or six yeras, by which time the trees will have been exhausted, and supplies will have to be brought from a greater distance at increased cost—that is, assuming the rubber plants to exist in the remoter regions. The total area of the plantations already established is estimated at about 2,000 acres, but many parts are not fully stocked, great difficulty having been experienced to preserving the trees from illicit tapping by the natives, even in the reserves. The present position of the rubber industry in Assam is very fully discussed in a "Note on an Inspection of Certain Forests in Assam," by Mr. H. C. Hill, officiating inspector-general, forests, dated March 31, 1896, from which the following is taken :—

"The illicit tapping of trees in reserves, sparsely scattered over miles of almost impenetrable evergreen forest, with an undergrowth of cane. is easily explained. The roughly-collected impure rubber sells at a rupee a seer, and to obtain a number of seers, which are interchangeable for twelve times their weight of rice at the nearest Koya's shop, a man has only to make his way to a tree, make cuts in the roots, and, returning three days later, collect his spoil. No system of inspection, paths, or staff of patrols, would render protection effective over a block of forest of 200 square miles, such as the Balipara and Charduar reserves, with, perhaps, ten or twenty trees to the square mile in the richest parts, even if men could be got to stay in the forest in the rainy season. Under existing arrangements, the tapper works in the rains, when all guards are withdrawn. The northern boundary is uninhabited and trackless except for wild elephant paths ; therefore, the rubber, once collected, is easily carried across the line, to be reimported as foreign produce. The result is the continued destruction of the trees in reserves, as well as in unclassed forests, and if this is the state of things within the inner line it may be safely concluded that the trees are being generally killed off across the line. The only prospect of assuring a continuous rubber supply seems to be in the direction of artificial plantations, where the trees can be concentrated on a limited area, the effective protection and exploitation of which will be possible. Can these plantations be expected to become a profitable investment? The Government of India decided in 1894 that the further extension of the plantation was not advisable, because a considerable amount of expense would be incurred, and there was a great doubt whether the expenditure would prove remunerative, and fur.her, because, even if it were remunerative, many years must elapse before any profits could be obtained. In any opinion, the cost of establishing a plantation where open lands are planted, as in 1892-3, may be estimated at R30 per acre; the existing plantation has cost R50, but, with the experience gained, there can be little doubt that operations will be cheaper in the future. The prospective yield of the plantation has been discussed at length, but it would seem that some assumptions have been made too unfavourable to the plantation. Trees have been put out seventeen or eighteen to the acre, and it has been assumed that half would, disappear and seven or eight remain per acre but I think it may reasonably be held that more than eight trees will be permanently maintained. Admitting that an acre with eight trees or more will yield 40 seers at a tapping, which may be repeated every five years, the net value of the rubber being R80 per maund, the return per acre per annum becomes R16. If R40 be taken as the initial outlay per acre, and calculated at 3½ per cent, componnd interest, it amounts to R220, and interest bein paid on this at 3½ per cent., out of the R16 there would still he a net return of R8 per acre per annum. If these views are accepted, there would seem to he a good case for extending the plantation by 250 acres a year, at a cost of R10,000, for the next twelve years at least. Bythat time it would cover an area of 5,000 acres, the prospective yield of which would add a net in come of at least R80,000 to the forest revenues of the province."—*H. & C. Mail.* Feb. 19.

THE SUGAR COMMISSION IN BRITISH GUIANA.

GEORGETOWN, BRITISH GUIANA, FEB. 4.

The Royal Commissioners, Sir Henry Norman, Sir David Barbour, and Sir Edward Grey, arrived in this colony by Royal Mail steamer a week

ago and in the interval they have examined some thirty witnesses representing all classes and interests in the community, and have visited two large and representative sugar estates. The amount of evidence taken is extensive and probably entirely exhaustive of the subject of the sugar industry and the large part which it fills in the commercial, social, and industrial life of the colony. Of such a mass of information it is impossible to give more than an outline, and it is sufficient to say that without exception the trend of the evidence has gone to show the identity of the interests of the colony with the fortunes of its staple industry. The expression used more than once has been "the sugar industry of the colony." In a previous letter I gave a few figures showing the predominant position of the trade of sugar growing and exporting in British Guiana, and it is not necessary to labour the point by repetition. It is, however, important to note that a great majority of the witnesses give it as their opinion that the sugar-cane is the only product that can be grown with any degree of success on the alluvial soils of Demerara. A considerable volume of evidence has been taken as to the practicability of alternative industries to sugar, but very little really satisfactory information is to be obtained. For years past the subject of "minor industries," as they are called here, has been *en l'air*, but wherever attempts have been made to raise anything besides cane or "ground previsions"—*i.e.*, plantains, cassava, yams, and so forth—failure has been the rule. The heavy salt soil is quite unsuited to cocoa, which is so successfully grown in Venezuela, and local labour conditions would render coffee unprofitable as an export commodity. The cultivation of rice is becoming general amongst the time-expired coolies who remain in the colony, and when proper machinery is introduced, it is probable that sufficient rice will be grown to meet local demands; but British Guiana can never hope to compete with India as a rice-exporting country so long as labour in the one country cannot be had under 1s a day —the irreducible *minimum*—and in the other may readily be obtained for 1½d. The conclusion to which one seems to be forced after studying the evidence given is that sugar, and sugar alone, can be sucessfully cultivated for export purposes on the coast lands of the colony. At present colonists are turning wistful eyes towards the interior, which, until the discovery of gold some twelve years ago, was allowed to remain a sealed book to the generality of the public. The development of the interior, however, cannot be adequately undertaken by a Government whose revenue is falling as steadily as its expenditure is increasing, and there is a lamentable dearth of private capital for such a purpose. The gold industry even, according to more than one witness, has not been an unmixed blessing, for it has absorbed thousands of pounds of local capital, only a small proportion of which has proved productive. What is chiefly needed is the introduction of foreign capital for the development of the goldfields, but until the boundary of the colony is finally adjusted that is hardly to be expected.

The Commissioners have devoted considerable attention in the examination of witnesses to colonial expenditure, and particularly to the cost of immigration, which constitutes a large drain upon the exchequer. Since the year 1878 the Government has borne one-third of the total cost of immigration, but, in view of the serious depresssion of the sugar trade, during the last financial year the Government share was increased to two-thirds. In addition the presence of thousands of indentured labourers on the estates necessitates the maintenance of an extensive medical service, the whole cost of which falls upon the colony. It was suggested by Sir David Barbour that this public expenditure on immigration is equivalent to a bounty to the planters, and the reply elicited was that the introduction of so many immigrants must benefit a revenue largely derived from the taxation of foodstuffs and clothing, and it was further stated that had it not been for East Indian immigration the population would have steadily decreased during the past 30 years. Other witnesses, however, have contended that from the point of view of the settlement of the country and the formation of a wealth-creating peasantry, the introduction of the coolie has proved a marked failure. Another very costly item which has figured in the investigations of the Commission is the payment of return passages, for which the colony is at present liable to the extent of £1,000,000. As it is, a considerable proportion of the coolies elect to remain in the colony on the expiration of their agreed term of service and residence, but the number is not satisfactory, and it is difficult to devise a means of increasing it without involving the colony in an expenditure on small bonuses equal to the cost of the return passages. The Commissioners remarked the fact that while the sugar industry is declining immigration is still maintained (2,425 coolies were imported during the year 1895-96), but the planters contend that a ready supply of indentured labour is absolutely essential to the carrying on of their industry, as no reliance can be placed upon the negro and the free coolie.

With regard to efficiency and economy in the cultivation and manfacture of sugar, expert and scientific evidence given before the Commission entirely bears out the statement which I made in my last letter upon this subject—namely, that he cost of production has been reduced to a *minimum* and the methods adopted are thoroughly up to date. It has been stated in the evidence given that the German manufacturers can show no process of production which might be considered an improvement upon those employed in Demerara, and the yield of the cane has been increased to a point beyond which it is practically impossible to go. And yet in spite of all his efforts the Demerara planter is unable to make headway against the brute force of bounties. During the past six years nearly 13,000 acres previously under can have gone out of cultivation, and it is only due to the happy circumstance that the past season has been exceptionally favourable that the whole of the existing plantations are still being carried on. One estate, indeed, has been abandoned and is now on the market, and another large plantation is in process of being "cropped." With two or three more equally favourable seasons there need be no immediate fear of a wholesale abandonment of estates—that is, provided that sugar does not fall lower in price than at present, and colonists are somewhat less inclined to regard their position as desperate than they were two or three months ago. One conclusion seems to be general, and that is that considerable economy must be exercised in the public expenditure of the colony.

The Commissioners sail on Saturday next for Trinidad.—London *Times*, Feb. 19.

LADY-BIRDS AND BUG.

Sir,—Your correspondent "Black Bug" in his letter to you of the 28th January, (this was written before receipt of our last issue.—Ed.) which appeared in your issue of the 6th instant brings up a point in connection with Lady-birds (*Coccinellidœ*) which has more than once occurred to me. So many estates in S. India are more or less heavily shaded that the fact of Lady-birds living or not living under shade may become a serious question. I have watched the habits of Coccinellidæ very carefully during the past year and a half and *have* found them under shade. That they are sun-loving insect is only too true, but I am inclined to think that as I have found them to do they will not hesitate to attack their prey under shade, although they will return to the unshaded and sunny tree on the estate to live and breed. From what I can gather I believe that the coffee in Hawaii was not to any extent shaded, and where large trees did occur they were citrous and as much infested with coccidæ as the coffee. Mr. E. E. Green's opinion on this point would be interesting.

I am not a Collector and have not studied Coleopteræ in general; but I fancy I could find more than five varieties of coccinellidæ on the coffee in this district. Would "Black Bug" care to have specimens and would he identify them for me? If so I shall be glad to correspond.

I quite agree with "Black Bug" that it is improbable that many varieties of Lady-birds would forsake their natural food to blunt their teeth on Black Bug (presumably "Black Bug" means *Lecanium Coffee* and not *Lecanium nigrum*), but this wont hold good with green bug (*Lecanium viride*) which is a soft shelled scale and would probably not only be a more plentiful but an easier prey for the Lady-birds where it is to be found.

With regard to your "occasional note" in same issue on Black Bug.

I shall be very much surprised to hear that *Chilocorus Nigritus* have been found preying on Black Bug (*Lecanium Coffee*). It is quite likely that *another* variety of coccinellidæ may be at work, though. I hope the Kotagiri planter will have given you the details you ask for in your next issue. Would he also kindly send some specimens?

I have just had my attention drawn to a letter of Mr. E. E. Green's in the *Ceylon Observer* of the 6th instant. In this letter Mr. Green suggests that the reason of the slow increase in numbers of *Chilocorus Nigritus* is due to its natural enemies in this country and suggests an exchange of the different specimons of Ladybirds with Ceylon with the view of experimenting with them in countries where their own parasite may not be found.

This is, I think, an admirable suggestion, and I shall be most happy to exchange some of our coccinellidæ. Just at present unfortunately both the Green Bug and the Lady-birds are dormant, but in another month specimens should be fairly easily obtained.

I am only afraid that Ceylon and S. India are too nearly allied to make it impossible that parasites may be found in both countries or at any rate that the specimens one exchanges may be so nearly allied that the parasites will not hesitate in transferring their attention from the exported to the imported Ladybirds.

However, as Mr. Green says the experiment would be inexpensive and easily carrried out, and I think (and hope) may result in practical mutual benefit.

Pillavaly Estate, HOWARD NEWPORT,
Hon. Sec., L. P. P. A., Dindigul.

Madura Dist., 15th Feb. 1897.

—*Planting Opinion*, March 6.

TEA IN THE FUTURE.—A tea proprietor writes: —"What do you think of present prices for tea properties; are they likely to last another year or two? Over-production and low prices rather alarm one." And with some reason: it is very difficult to say what the next year or two may produce!

THE MAHA UVA ESTATE COMPANY, LIMITED.

The annual ordinary general meeting of the above Company was held at the Company's Offices, No. 7, Queen Street, Fort, Colombo, on the 13th March.

The following is the Report:—

ACREAGE.

Tea in full bearing	299 Acres.
,, ,, partial bearing	200 ,,
,, not in bearing	118 ,,
Coffee amongst Tea (130 acres)	
Cardamoms	80 ,,
Grass	15 ,,
Total Cultivated	712 ,,
Jungle and Waste land	211 ,,
Total of Estate	923 Acres.

The Directors have pleasure in submitting to the Shareholders the Accounts of the Company for the past year.

The following are particulars of the Crops and prices secured in 1896, as compared with 1895:—

	1896. Crop.	1896. Net average price.		1895. Crop.	1895. Net average price.	
	lb.	R.	c.	lb.	R.	c.
Tea	155,020	—	49	105,472	—	52
	bus.			bus.		
Coffee	369	16	12	2,453	16	80
	lb.			lb.		
Cardamoms	502	1	60	615	1	18

The increase in the yield of Tea is very satisfactory, being 18,020 lb. in excess of the estimate for last year. 275 acres of the oldest Tea, which extent cannot yet be considered as in full bearing, gave an average yield of 463 lb. per acre.

In the last Annual Report it was mentioned that the Directors proposed, during the past year, to issue the balance of the authorized Capital of the Company, viz., 30 Shares of the nominal value of R500 each. This was done in June last at a premium of R400 per share, and the amount so realized appears at credit of the 1896 Profit and Loss Account, which shews an available balance of R43,156·06. The Directors recommend that the Share Premium referred to, viz., R12,000, be transferred to Depreciation Account. An interim dividend of 4 per cent on the Capital at 1st January last, viz., R285,000 was declared on 8th August last, absorbing R11,400. In terms of the Directors' circular of 26th March last the Shares issued in June are to rank for Dividend at the rate of one half of the total dividend for the year. The Directors now recommend that a final dividend of 5 per cent be paid on the Capital as at 1st January last, viz., R285,000 making 9 per cent for the year, and that a dividend of 4½ per cent be payable on the last issue of shares, viz., R15,000. After payment of these dividends a balance of R4,831·06 will remain to be carried forward to the current year's account.

The Capital account outlay during the past year amounted to R14,746·55, being for cost of acres 14.3.22 land added to the acreage of the Estate, for additions to Buildings and Machinery and for outlay on young and new clearings.

During the current year about 200 acres planted with tea in 1893 will give some crop. The Crops estimated for 1897 are 170,000 lb. Tea, 300 bushels Coffee (a preliminary estimate), and 1,000 lb. Cardamoms against an expenditure of R51,323 for delivery of same into Colombo. The outlay on Capital account is estimated at R8,360, mainly for upkeep of the acreage not yet in bearing, and additional line accommodation.

On the departure from the Island of Messrs. C. Young and G. W. Carlyon, Messrs. E. J. Young and A. Thomson were respectively appointed to the vacancies in the Directorate thus occasioned. In terms of the Articles of Association Mr. A. Thomson now retires by rotation but is eligible for re-election.

Mr. R. L. M. Brown having resigned the post of Auditor to the Company, the Directors, under the Company's Article No. 92, appointed Mr. T. J. Stephen to fill the vacancy thus occasioned.

The appointment of an Auditor for the current year rests with the Meeting.

By Order of the Directors,
WHITTALL & Co.
Colombo, 2nd March. 1897. *Agents and Secretaries.*

THE DRAYTON (CEYLON) ESTATES CO., LIMITED.

A general meeting was held on March 13th at 11, Baillie Street, Fort.

The Directors' report is as follows :—

The Directors beg to submit the Annual Balance Sheet and Profit and Loss Account for the year endind 31 December, 1896.

After providing for depreciation of buildings and machinery, the balance of profit available is R25,815·91. The Directors propose that a dividend of three per cent. be declared, making, with the interim dividend of eight per cent, eleven per cent for the year, and the balance R4,365·91 be carried forward to next year's account.

The crop of tea secured from the Company's estates including 27,755 lb.. tea made from Cwm leaf was 386,776 lb., against an estimate of 400,000 lb.

The total cost of the 386,776 lb. tea was 27·99 per lb. including Cwm rent, but exclusive of depreciation, and estimating that the tea unsold will fetch 47 cent per lb. the nett value realised for the whole crop will be 50·92 cent, showing a profit of 22·93 cent per lb.

The Company's properties consist of Drayton :—

Tea Bearing	..	685 acres.
Young Tea	..	84 ,,
Grass Land	..	18 ,,
Timber	..	10 ,,
Forest	..	17 ,,
Waste Roads, &c.	..	69 ,,
Yuillefield :—		
Tea in Bearing	..	207 ,,
Young Tea	..	11 ,,
Forest and Timber	..	7 ,,
Waste	..	8 ,,
		1,116 acres.

The estimated crop for 1897 is 405,000 lb. to cost 27½ cent F.O.B. Adding rent of Cwm R4,500 the cost will be rather over 28½ cents.

Estimate allows of 2¼ cents per lb. being spent on manuring.

Mr. A. R. Wilson-Wood resigned his seat at the Board on his departure from the island, the Directors elected Mr. Harry Whitham a Director in his stead.

In terms of the articles of Association, Mr. Harry Whitham retires from the Board by rotation.

Mr. A. R. Wilson-Wood having since returned to the island offers himself for re-election as a Director.

The Shareholders will be requested to appoint an Auditor for the current year.—By order of the Board of Directors,

HARRY WHITHAM, Secretary.
Colombo, 2nd March, 1897.

TEA "OXIDIZER."

Mr. Nathan Sharpe, the well-known Patentee of Tea Packing and other Machines in connection with Messrs. Richard Moreland & Sons, is at present on a visit to Ceylon. The first of his "Oxidizers" is on the way out and is to be erected on Bandarapolla estate. Mr. Sharpe is sanguine about its good work and great saving of space : he will remain six weeks in the island.

Mr. Sharpe got the idea of his machine from remarks in the lecture by Mr. Christison before the Society of Arts where we also were present and spoke. We read of the machine :—

THE "SIMPLEX" COOL OXIDIZER.—Various systems now prevail in the tea districts, especially in the plains, for the purpose of keeping rolled tea leaf in as cool a condition as possible whilst undergoing the important chemical change of Oxidation, more commonly expressed and termed "Fermentation." The Inventor of this machine thought that a great deal of room, labour, etc., could be saved by bringing the leaf under treatment into a more economical space and applying a cheap and efficient method of cooling the air, which would come into closer contact with the leaf, and perform a perfect cool oxidization of the leaf throughout the process. Methods of cooling air have (and still are, in other manufactures) been somewhat costly items, and we might say that a great deal of thought and attention has been bestowed on this machine, to enable us to present it to the notice of the Planting Community as it now stands, simplicity itself, therefore reasonable in cost.

LEAF SURFACE.—The machine consists of series of racks which support 144 leaf trays, 3 feet long by 2 feet wide, which gives 864 square feet of leaf surface, in a ground space of 12 feet by 6 feet, therefore the machine, when fully charged, will hold 36 Rolls or about 11,000 lb. of rolled tea leaf.

THE ANKANDE ESTATE COMPANY OF CEYLON, (LIMITED.)

The first ordinary general meeting of Shareholders of the Ankande Estate Company of Ceylon, Limited, was held at the Company's Registered Office, 22, Baillie Street, on the 13th March.

The report is as follows :—

The directors have pleasure in presenting to the shareholders their first annual report with a duly audited statement of the Company's affairs as at December 31st, 1896.

The Company took possession on January 1st, 1896, as a going concern of three estates constituting the Company's property, consisting of, and at the prices below stated :—

	Aukande.	Glenury.	Altwood.	Total.
	R	R	R	R
Price Paid.	60,700.	14,789.	30,221·17.	105,710·17
Acreage Tea..	91 acres in full bearing	18 acres in full beariug	7 acres 1 to 5 years	acres 116 Tea
Do Cocoa & Liberian Coffee ..	60 acres in full bearing	..	..	114 Cocoa and Liberiau Coffee.
Do Cocoa..	17 acres under 2 years	37 acres in full bearing	..	
Do Cardamoms..		..	93 bearing	93 Cardamoms
Do Unopened	262 acres (heavy Chcua)	22 acres	2 acres	286 uuopened
Total Acreage	430 acres	77 acres	102 acres	609 acres

The various crops gathered during the year exceeded the estimates in every case, and the prices obtained were well up to market averages.

After writing of preliminary expenses, paying interest on R23,510·17, part of purchase money outstanding on loan from vendors and placing R2,500 (returned by vendors, as working capital as arranged with them) to reserve, there remains an available balance of R7,877·28, out of which the directors propose paying a dividend on vendors' shares (R82,200) at the rate of 4 per cent per annum, and carrying forward the balance of R4,589·28 to 1897.

The estimates of ordinary expenditure and revenue for 1897 are as follows:—

	Ankande.	Glenury.	Altwood.	Total.	
	R.	R.	R.	R.	
Expenditure	15,450	2,035	3,560	21,045	for 1897.
Revenue	21,250	2,975	8,400	32,625	
Balance	5,800	940	4,840	11,580	Total estimated profit.

The directors propose to increase the cultivated area of Ankandc by clearing up and planting in tea during the S. W. monsoon 50 acres and during the N. E. monsoon further 50 acres, total 100 of the unopened heavy chena land there.

According to the articles of Association the whole of the directors retire, but being eligible offer themselves for re-election.

The appointment of Auditor also rests with the meeting.

Lewis Brown & Co., Agents and Secretaries.

PROSPECTS OF "TEA" IN LONDON.

Several letters from "the City" by this mail are marked by quite a cheery tone as to the prospects of tea and Tea Companies. One gentleman, who pays close attention to "tea," thinks it is going to take the place of "gold" in the esteem of provincial investors throughout the United Kingdom, in view of the great loss sustained of late through "gold mining shares" in Western Australia and even in South Africa. We quote as follows :—

The public are looking with increased interest after tea shares, since they have suffered so much in gold mines without a prospect of getting any return from many of them. There are buyers from all parts of the Kingdom and I believe we shall see a considerable expansion of business this year and the number of new companies coming out will form wider field for investors.

"The unsettled political outlook has a very serious effect upon general business just now, for people do not know what may be the result of the bellicose Greek and unless the Powers are united as to what is to be done serious sonsequences may still further develope."

From another City authority we have the following :—

"Mr. James Sinclair has returned from Ceylon, very favourably impressed with the appearance of the properties owned by the Dimbula Valley Tea Co., and the satisfactory future that lies before it. Quarantine regulations prevented his landing at Brindisi or Marseilles, as the authorities at these ports absolutely prohibit the landing of any passengers from the East, except under the most galling restriction, and a delay which renders the voyage round to Plymouth much preferable in every respect."

"The feature of the last few weeks has been the strong position of the Indian tea market, owing to the short supplies. Ceylon teas have shown some improvement and the market is stronger, but prices compare very unfavourably with those obtained the Indian teas."

"There is a lull in the production of Tea Companies. Owners are asking very high prices, whilst the unsettled state of the political horizon render investors very cautious with their moves."

THE KNAVESMIRE TEA ESTATES COMPANY LIMITED.

The first ordinary general meeting of the Knavesmire Tea Estates Company, Limited, was held on the 13th March, at the Registered Office of the Company, No. 14, Queen Street.

The Directors' Report is as follows :—

Directors:—H. O. Hoseason, Esq., A. G. L. Dupuis, Esq.

Your Directors have now to submit their Report and Accounts for season ended 31st December, 1896.

The accounts cover the first twelve months of the Company's work, and shew a balance at credit of "Profit and Loss" of R19,799·69, out of which the Directors recommend payment of a Dividend at the rate of 7 per cent per annum. A Dividend at that rate will absorb R17,717·67, and leave a sum of R2,082·02 available to cover Directors' fees, and to liquidate in part the expenses connected with the formation of the Company, and transfer of the Estate.

The past season's Tea Crop amounted to 250,940lb. upon an estimate of 250,000 lb., and the Directors are confident that a materially larger yield would have been secured, had the labor force been on a satisfactory footing all through the year.

The Labor question is still a source of anxiety to the Directors, but in some respects the position has improved of late, and the efforts of all concerned are being directed to bring about such an increase of the force as will admit of the property being cropped up to its full capacity in the future.

For 1897 the Directors have decided to fix the Crop Estimate at 300,000 lb., a figure which they regard as well as within the mark, assuming an adequate Labor force. The cost of producing the above Crop and placing it in Colombo is estimated at R63,930.

In terms of the Articles of Association all the Directors retire on this occasion, but are eligible for re-election.

Geo. Steuart & Co., Agents & Secretaries.

THE KIRKLEES ESTATE COMPANY, LIMITED.

The annual ordinary general meeting of the above Company was held at the Company's offices No. 7, Queen Street, Fort, Colombo, on the 13th March.

The following is the Report :—

ACREAGE OF KIRKLEES ESTATE.

Tea in bearing	..	280	acres.
,, ,, partial bearing	..	32	,,
,, not in bearing ..	..	80	,,
Total Tea		392	acres.
Cardamoms ..	..	20	,,
,, and Timber	..	4	,,
Timber	..	56	,,
Uncultivated Land ..	..	245	,,
Total		717	acres.

The Directors have pleasure in submitting to the Shareholders the Accounts of the Company for the past year.

The Crops secured in the year were 88,597 lbs. Tea, 86 bushels coffee and 736 lbs cardamoms. The average net prices realized were 54½ cents per lb. for the tea, R16·65 per bushel for the coffee and R1·35 per lb. for the cardamoms.

After making ample provision for depreciation of Buildings and Machinery the net profit for the year amounted to R13,117·11, to which has to be added the balance brought forward from 1895, R1,541·57, making a total of R14,658·68 available for dividend, equal to about 14⅔ per cent. on the Capital of the Company. An Interim Dividend of 5 per cont was paid on the 6th August last, and the Directors now recommend a final dividend of 8 per cent, makf ing 13 per cent for the year, leaving a balance of R1,658·68 to be carried forward to the current season's account.

The estimates for this year are 95,000 lbs tea, 50 bushels coffee and 1,000 lbs, cardamoms, on an expenditure of R33,680.

The estimate of expenditure on capital account is R12,300, which provides for the upkeep of the tea not yet in bearing, additions to Machinery and Buildings and a survey of the Estate.

During the year Mr. G. W. Carlyon resigned his seat on the Board, and Mr. A Thomson was invited to take his place. In terms of the Articles of Association Mr. G. H. Alston retires by rotation from the office of Director, but is eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

By order of the Directors, Whittall & Co.
Colombo, Feb. 27th, 1897. Agents & Secretaries.

PLANTING AND PRODUCE.

(From the *H. and C. Mail*, Feb. 26.)

PUSHING TEA.—The pushing of tea by retailers goes along merrily. We notice that a Glasgow store gives "sugar for nothing" in the proportion of half a pound to each quarter-pound of tea at 4½d. We trust that the day will never arrive when tea will be given away with something else. It is an age of over-production and consequent low prices, but tea is an exceptional position, at least in some respects. It cannot as yet be grown even on bounty terms in Europe, and the Chinese and Japanese have not yet started on their threatened raid on the markets of the world.

THE SUGAR COMMISSION.—From an account of the first sitting in Demerara of the Royal Commissioners, which we give in another column, it will be seen that the evidence of planters, Government officials, magistrates, merchants, chemists, engineers, and others has been taken. The opinion generally expressed appears to have been that all has been done that can be done to make the sugar industry of British Guiana profitable, and it is claimed that the one thing needful is fair competition, on a natural basis. The Commissioners intend visiting the islands of the West Indies. Apropos of the sugar supply and the Sugar Commission, Lord Stanmore presided on Monday night at the Imperial Institute at a lecture on "The Past, Present, and Future of the Sugar Supply of the British Empire," by Mr. C. A. Barber. The subject was treated in a comprehensive manner, and was illustrated by a large number of views on the screen. After referring to the enormous growth of the consumption of sugar at different periods, Mr. Barber said that in 1895 the total consumption in Great Britain was 1,566,000 tons. Fifty years ago cane produced nearly all the sugar, but there had been a factory established for the manufacture from beet at the beginning of the century. He referred to the large quantity sent here by France and Germany, and to the unfair system of bounties; and, in concluding his lecture, remarked that the future of sugar was full of interest. Beet was going to stay whether bounties continued or not. The British colonies were in a very bad way, there was no doubt about that, and many proprietors would be ruined. He believed, however, that coarse sugar could be produced so well and cheaply in the islands that ultimately they would emerge from the trial. The question was how many of the present race would see the triumph? The Commission that had gone out to the West Indies would find that they had other things to contend with besides bounties.

TEA IN RUSSIA.

Mr. Wm. B. Steveni, who claims to have been the very first to have given a start to Ceylon Tea in Russia—immediately after our meeting him at Vichy in France, in Sept. 1887—writes as follows by the mail delayed through the "Orotava":—

St. Petersburg, 22nd Jan. 1897. Add: 15 Admiralty Canal.—Some weeks ago I wrote a long letter * advising you to have some articles written in the leading Russian papers *re* the excellent qualities of Ceylon tea. As I cannot write Russian myself *i.e.* well enough for the press, I, personally, should reap no advantage from these articles being written; but I cannot help but think that the planters—if they are wise—would make use of this offer. I also hope they will not forget the man who first conceived the idea of introducing Ceylon tea into Russia and paved the way for Rogivue and his assistants. I really do not care what form the testimonial takes; but I think if the tea planters are men of fine feeling they will not forget me. I suffered so much ridicule *and even loss* in this attempt, that I should like to have something to show for it—*even if it were only a tea-caddy*! You, I am sure, can understand this feeling. I find Ceylon tea is now being sold here. It is however making slow headway. The taste does not suit the public and perhaps the quality is not quite as good as it might be. I know I bought ½ a lb. not long ago; but the quality is so poor that I cannot finish it. *It costs R2·20 per lb.*

We leave the P. A. Committee or rather the Committee of Thirty, to say whether they feel inclined to send Mr. Barnes-Steveni an "Oriental tea-caddy" as a memento to the first man who stood up for Ceylon tea in Russia? And in addition to empower him to spend £5 or £10 on a series of articles in the Russian press on the goodness of our Ceylon teas.

* Not received.—ED. *T.A.*

PLANTING PRODUCTS.

(Extracts from the Forty-third Annual Report of the Ceylon Planters' Association, held 17th March, 1897.)

TEA.—The estimate as furnished by our Hon. Secretary at the instance of the Parent Body is 2,800,000 lb. made tea. Further large acreages have been planted under tea during the year now under review, the weather for such operation being exceptionally favourable. The further lowering of prices for our teas, and the upward tendency of exchange during the latter portion of the year will doubtless suggest to members the great importance of exercising all judgment and caution in the future selecting of tea land, as the old cry of "overproduction" is now being raised, and we may have to face smaller profits in consequence. The high favour in which Tea Companies in Uva are viewed by the public, as attested by the Colombo share lists, goes to prove how eminently suitable our soil and climate are to the tea bush. The north-east monsoon rains were severe and continuous, thereby seriously retarding our flushes during those rainy months. For the sake of record, your Committee think it interesting to commit to writing the fact that in the month of December the flood water touched the Badulla bridge!

COFFEE.—Your Committee feel it unnecessary to allude to this products (Arabian) at any length. Age (in many instances), green bug, and leaf disease are steadily performing their mission of destruction, and it is now pretty well allowed as hopeless to successfully cultivate this product. The *Liberian* variety has received considerable attention in the Mooneragalla district, with varied results. Crops generally have been very short indeed.

COCOA.—Much new land has been planted under this product, especially in the Mooneragalla district, where it is so thoroughly established and grows luxuriantly. Beyond a little "Helopeltis" to be observed here and there, this industry so far may be said to be free of pests, and requiring, as it does, so small a labour force, it is peculiarly adapted to these days scarce of labour.

NEW INDUSTRIES IN THE KURUNEGALA DISTRICTS.

(From our Correspondent.)

I.—COCONUT MANUFACTORY, COCONUT OIL, FIBRE, AND DESICCATING MILLS.

The name of J. H. Vavasseur & Co. will ever remain intimately connected with the introduction into Ceylon of an industry which, in point of importance in the labour it employs, the capital it involves, the prominence into which the island is brought by it in various parts of the world, promises to be second to none of the other industries here—namely coconut desiccating. Desiccated coconut already forms a principal article of export and one of the most popular shapes in which the product of the coconut palm is sent out of the island. Mr. John Clovis de Silva, the well-known merchant, with commendable zeal foresight and enterprize, has added to our provincial industries this useful branch, and in the space of a month

or so, Kurunegala will boast of a coconut manufactory, coconut oil, fibre and desiccating mill in full working swing. In a coconut district such as this is, the usefulness and importance of a manufactory of this kind cannot be overestimated. Rather than allow tho principal agricultural product to leave the district and be diverted into various channels outside its borders it will attract and utilize the trade, offer a ready market to the district owners of coconut, and open out a never-failing field of work to the labouring classes. Such a public benefactor deserves well of his countrymen, and in giving the following description of the mills, which will probably commence operations in April or May next, we wish Messrs. J. C. de Silva & Co. of which firm, Mr. John Clovis de Silva is the chief partner and moving spirit, every success in his new venture.

THE MILLS.

The main building is one of the most imposing structures in Kurunegala. It stands on a plot of ground, about 10 acres in extent, on the Circular road, South, in the hamlet Vilgoda, and is about a mile from the Jail Corner. The roof is of zinc, and tho wall of red brick, pointed with cement, while the doors and windows are painted chocolate. A 6 ft. brick wall with massive gates runs along the road frontage. The *tout ensemble* is picturesque in the extreme.

The main building is 203 ft. long and 86 ft. wide, and occupies the central portion of the land. For purposes of internal economy and arrangement the building is divided into three portions to serve threo departments.

(1) THE DESICCATING DEPARTMENT

which takes the right hand side of the building, and occupies the largest space, 153 ft. by 86 ft. Then this space is again subdivided into (a) the packing room and (b) the desiccating room. There is accommodation for eleven desiccators, but only three have been fitted up for the present, and are similar to those used in the tea factories.—Brown's patent single desiccators, manufactured by the Colombo Commercial Company. The desiccators occupy the entiro length of the room on the southern side, the engine room being at the extreme end on the east. The engine is 8' by 13¼' by 20" compound tandem condensing engine, with 9' 0" by 5' 0" type D cylindrical multitubular boiler by Ruston Proctor & Co., Lincoln. It is the first of its kind imported into the island. Another imported, after it, has lately been fitted up at the New Ice Mills, Colombo. The enormous amount of time and labour and expense saved by the use of a compound as against a simple condenser, is too well-known to be repeated. The boiler in question will develop 12 nominal and 50 indicated horsepower.

The other machines to be used in this department are the slicing, grating, and stripping machines. The grating machines are from the Commercial Company, Colombo, and the slicing machines from C. A. Hutson & Co., Colombo. The shelling of the coconuts will be done by axes, and the shaving by spoke shaves used manually, chiefly by women and boys.

There are also one hot water tank to boil coconuts in and a washing tank in which the nuts are washed.

THE OIL DEPARTMENT

is just in front of the ground taken up by the fibre department, and occupies a space 90 ft. by 25. This department is not to be worked just at present, and will commence operations probably somo time after the other two branches are sufficiently well developed and all in proper working trim. When this department begins work, Richard's occupation at Gangoda will be gone. Gangoda is a hamlet in Kurunegala, where the native oil mills (chekkus) do a small trade, which at one time flourished. Tho chief residents aro Tamil chetties, who wero one timo well-to-do men but strange to say, not one ever succeeded in keeping the money, (and in days of yore it was not such a rare commodity as it now is), he piled up. There is not a single man now at Gangoda among the oil-mongers who is above want.

"Something ails it now
The place is curst."

THE FIBRE DEPARTMENT

is just behind the oil room and covers a space 54 feet by 86 feet. Ten fibre drums have been set up along the southern length of the hall, and will be worked by the same shaft as the other machines.

Then there are the crushers to crush the husk, the winnowers to shift the fibre, while the most interesting branch of the department is the "heckling shed," where the fibre is combed and dressed. It is said that young women are as a rule employed for this kind of work and perhaps with much reason for a gay pert damsel would "do up" the fibre as she would her own hair, which you could not expect from the sere and yellow leaf! So there will be an excellent opening for Miss Kurunegala at the Mills, when work is in full swing. Then, again, there are the balloting presses. We next come to the tanks which are right behind the fibre room and are two in number. They measure 26 ft. by 23 ft. each, These tanks are used for soaking the husks, and are fed by the well adjoining it, which was constructed by contract for a sum of R750.

THE SUPERINTENDENT'S BUNGALOW

stands on the right and a little distance away from the main building, It is to be an upstair building with two bed rooms and a hall at the top, and two rooms, a dining hall, and office with outhouses, etc., below.

BUILDING MATERIAL.

With the exception of fire-bricks imported from J. and M. Craig, Kilmarnock, the rest of the bricks used was supplied locally, principally by the well known kiln at Malpitiya, three miles from Kurunegala—which has won quite a reputation for the superiority of its bricks. Locally manufactured bricks were largely used in the construction of bridges and culverts on the Kurunegala branch of the railway, and Mr. Waring wrote in his final report :—"The bricks used for the most part were made at brick fields on and near the work, tho remainder having been made at Colombo. The locally made bricks were, I think, fully equal to those from Colombo." In this connection it would be interesting to know whether fire bricks were ever made in Ceylon. Is not fire-clay to be met with in the island? If fire-bricks have not been made, perhaps it is due to the fact that they do not command a market here, and that it is cheaper to get the imported article.

The zinc roof was supplied by Messrs. Hutson & Co. and the timber bought locally, while the workmanship so far as tho wood work goes was contributed by Moratuwa carpenters, the masons being men of the place.

THE STAFF.

Mr. R. C. Dickson, a competent practical Engineer, supervised the setting up of the machinery and to some extent the fixing up of the roof, on a special agreement. Mr. Dickson was at one time residing at Kurunegala, and daily visiting the manufactory, but as the work progressed, he changed his residence to Kandy and now pays periodical visits. It will interest the friends of Mr. Sydney Morse, whose memory is bound to live long in musical circles, that Mr. Dickson as well as his brother served the same apprenticeship as Mr. Morse and his brother did in Scotland, in qualifying themselves as practical Engineers, and that they all passed out at the same time. Nothing surprised Mr. Dickson moro than on suddenly coming face to face with his quondam fellow-apprentice in tho streets of Kandy! Mr. Dickson is a nephew of Dr. Cochran, the City Analyst. Mr. Dickson's trusty lieutenant is Mr. Henry de Silva who has had ten years' experience in the desiccating mills of Messrs. Vavasseur in Colombo, also at the Kelaniya Mills, and who will be tho Superintendent of the Machinery when the work starts. Mr. Silva is busy in carrying out the work, according to tho instructions laid down. For most

of the particulars contained in this account and for the exceptionally kind and obliging manner in which everything of importance and interest at the work was explained and shown, the writer is gratefully indebted to Mr. Silva and to Mr. Mendis, the able and energetic agent of Messrs. J. C. de Silva & Co.

THE COST OF THE WORKS

we can only give a guess at. If they cost a cent they have cost their proprietor certainly R40,000, inclusive of machinery, which he is sure to recoup, and we trust with handsome profits before long. It is his intention at present to commence work with about 20,000 coconuts per diem. There are mills which use up as many as 60,000 per diem. At the modest rate at which Mr. Silva proposes to make his start, there will be a never-ceasing demand for coconuts in every part of the district. Mr. Silva already owns thousands of acres in the Kurunegala district, and he has the lease of extensive plantations; nevertheless he will have to place lands other than his own, under contribution to meet the daily demands of his mills.

THE POPULARITY OF DESICCATED COCONUT

is widespread, but the writer never could understand why there is such a halo of secrecy around desiccating manufactories as to prohibit the entrance of visitors into the charmed places where the desiccating goes on. Is it the risk run by the secrets of the trade being found out, or the chance of some spy getting a tip or a wrinkle which may be only known to the charmed circle, that the desiccating rooms are so jealously guarded and watched, or can it be that the entrance into these rooms means so much diminution of the manufactured article which is the greatest temptation to the visitor to resist the tasting of?

PACKETS OF DESICCATED COCONUT.

Talking of the high favour in which desiccated coconut is held by "strangers within our gates," Mr. Silva mentioned to the writer that it was as much as he could do to keep off the inquisitive and itching fingers especially of the fair visitors to the mills he had worked in, from picking at the scrapings, on the invariable plea of "just to have a taste only of the nice stuff." At times, on weighing the desiccated coconut at the close of the day's work, as much as 20 and 30 lbs. were found short, the result of the visitors gratifying their taste! With a view of preventing this gratuitous and of "admittance except on business," Mr. Silva proposes to have little packets made up of desiccated coconut, with printed labels containing instructions as to the way in which the contents may be turned into pudding etc., and to sell the packets at a nominal rate. This idea will certainly have the desired effect of checking "shortage and intrusion." The packet will doubtless be a boon and a blessing.

THE THIRTY COMMITTEE.

Minutes of Proceedings of a meeting of the "Thirty Committee" held at Kandy on Saturday the 13th day of March 1897 at half past seven o'clock in the morning.

Present:—Messrs. J. N. Campbell (Chairman), A. Philip (Secretary), R. S. Duff Tytler, F. C. Gubbins, A. A. Bowie, J. P. E. Ryan, Gordon Pyper, H. V. Masefield, H. Cumberbatch, C. E. Welldon, E. Rosling, F. G. A. Lane, Oliver Collett.

The notice calling the meeting was read. The minutes of proceedings of a meeting of the "Thirty Committee" held at Kandy on Monday the 1st day of February 1897 were submitted for confirmation.

Read letter from Mr. J. H. Renton regretting his inability to be present.

Read letter from the Secretary, Ceylon Chamber of Commerce, notifying that the following members were recently elected to represent the Chamber on the "Thirty Committee,"—Messrs. Gordon Frazer, J. H. Renton, C. W. Horsfall, H. Cumberbatch, P. Bois, while Mr. F. M. Mackwood as Chairman of the Chamber will continue to be on the Committee.

Read letter from the Manager, National Bank of India, Limited.

Read letter from Government acknowledging receipt of copy of the minutes of proceedings of a meeting of the "Thirty Committee" held at Kandy on the 16th January 1897.

REPRESENTATIVE IN AMERICA.

Read letter from Mr. Mackenzie to Mr. Sackville dated London 10th January 1897; also the accompanying enclosures.

Read letter from Mr. Mackenzie to Mr. Philip dated London 14th January with statement of expenditure on account of the Committee to 8th January 1897, 19th January, 27th January 1897. Resolved:—"That the sum of £3,000 sterling applied for be placed at Mr. W. Mackenzie's credit at London by wire for the American campaign.

Read letter from the Secretary, the Ceylon Association in London, forwarding the following resolution passed by the Tea and Produce Committee of the Association at a meeting held on the 18th January.—"That the Secretary be requested to ask the Committee of Thirty on what general principles the amount raised in Ceylon by the taxation of tea is spent.

"What amount is expended in America—and to ask that an account of expenditure for the year 1896 (without details that it may be considered injudicious to publish) be sent to this Committee."

Read cablegram from Mr. Wm. Martin Leake, dated 1st February 1897, reading "Mackenzie sailing Saturday; please telegraph credit £1,000."

Intimated that the request had been complied with. Resolved:—"With reference to the resolution forwarded by the Ceylon Association in London, that in terms of his letter to the Secretary dated London 19th January 1897, Mr. Mackenzie be requested to give the Committee of the Ceylon Association in London such details and particulars regarding the disposal of the funds granted to him for pushing and advertising Ceylon tea in America as may appear to him judicious."

Resolved (II):—"That in answer to the specific questions the Ceylon Association in London be informed, (*a*) on what general principles the amount raised in Ceylon by the taxation of tea is spent?"

The general principles are advertisements and demonstrations in localities which are being specially worked, and by assisting those who are spending their own money in pushing Ceylon tea.

(*b*) WHAT AMOUNT IS EXPENDED IN AMERICA.

The amount expended in America up to say 31st December 1896, as per Mr. Mackenzie's accounts is £17,090 9s 8d. (Seventeen thousand and ninety pounds nine shillings, and eight pence.)

(*c*) That an account of expenditure for the year 1896 (without details that it may be considered injudicious to publish) be sent to this Committee.

That Mr. Mackenzie will be requested to give the Committee of the Ceylon Association in London such information as he may deem judicious.

CEYLON TEA IN RUSSIA.

Resolved:—"That with the object of further pushing Ceylon tea in Russia Mr. T. N. Christie be asked to visit Russia during the year 1897 and to report to the Committee as to the best means of securing this end; (2) that the sanction of Government be asked to an expenditure of a sum not exceeding £200 to cover all expenses Mr. Christie may be put to, during his visit to Russia in connection with the mission referred to in the above resolution."

CEYLON TEA ON THE CONTINENT OF EUROPE.

Read letter from Mr. R. V. Webster by his Attorney Mr. J.H. Renton acknowledging receipt of cheque for R7,852·76 being the equivalent of £500 sterling granted to Mr. Webster for the purpose of pushing and advertising Ceylon tea on the Continent of Europe.

CEYLON TEA IN BELGIUM AND HOLLAND.

Read letters from Mr. E. R. Templer on the subject of his offer to push and advertise Ceylon tea in Belgium and Holland, and regarding the 1,000 lb. tea

sent to him with draft for £35 sterling, and stating that the tea was of such good quality that he had no hesitation in saying better or perhaps such good teas have never been sent to Belgium or Holland.

Resolved :—"That Mr. Templer be informed that the 1,000 lb. of Ceylon tea already sent to him may be considered by him as a free grant, the proceeds to be used for further pushing the sale of and advertising Ceylon Tea, but that in future any business arrangements for additional supplies must be made to the Ceylon Tea Company Limited, direct or to any other firm. The Committee trusts that Mr. Templer will see the importance of continuing to keep stocks of Ceylon Tea through the ordinary Trade Channels; the Committee will be glad to have reports—as promised—from time to time of the progress made, and would add that any future grant will depend on the attendant results.

CEYLON TEA IN AUSTRIA AND HUNGARY.

Read letter from Messrs. Darley, Butler & Co. making an application for a grant of 500 lbs. of Ceylon Tea for distribution in Austria and Hungary on behalf of a correspondent in Vienna.

Resolved :—"That a grant of 500 lbs. of Ceylon Tea be made to Messrs. Darley Butler & Co. for the purpose indicated in their letter."

CEYLON TEA IN GERMANY.

Read letter from Mr. Chas. A. Bohringer asking for a grant of £50 sterling to be spent in advertising on y and paid over on production of vouchers showing how the money has been spent.

Resolved :—"That a sum of £50 sterling be granted to Mr. Bohringer on the terms stated in his letter."

CEYLON TEA IN SWEDEN AND NORWAY.

Read letter from Messrs. Akt. Bolg. Maren & Co., Stockholm a king for a contribution towards expenses to be incurred in introducing and pushing Ceylon Tea in Sweden and Norway.

Read letter from Mr. A. G. Seton recommending the application, and expressing the opinion that it affords a good opportunity for making Ceylon Tea known throughout the Scandinavian Continent.

Resolved :—"That a grant of £250 sterling be made to Messrs. Akt. Bolg. Maren & Co. for advertising and pushing Ceylon Tea in Sweden and Norway, and that they be informed that the Committee will be inclined to give them further support if they are able to open in other localities. The Committee will be glad if Messrs. Naren & Co. will send some particulars showing the places in which the advertising is chiefly done, and the approximate amount apportioned to each town.

Report and accounts for the year ended 31st December 1896.

Submitted and laid on the table Report of the "Thirty Committee" for the year ended 31st December 1896 together with the Abstract of Accounts of the Ceylon Tea (New Markets Fund) for the like period.

The "Thirty Committee" then adjourned.

A. PHILIP,
Secretary to the "Thirty Committee."

THE KELANI TEA GARDEN COMPANY. LIMITED.

A general meeting of shareholders of the Kelani Tea Garden Co., Ltd., was held at the offices of Messrs. Carson and Co, on the 13th March

The Report was as follows :—

ACREAGE.

282	acres	Tea in full bearing
52	,,	,, planted 1896
30	,,	Felled
224	,,	Reserve
588	acres	

The Directors have pleasure in submitting to the Shareholders the accounts of the Company for the year ending 31st December, 1896.

The crop secured amounted to 166,056 lb. of made Tea realizing R67,056·77, or an average price of cents 40·38 per lb., as against an expenditure (exclusive of items under Capital Account) of R39,505·83, or an average cost of cents 23 79 per lb.

The balance at credit of Profit and Loss Account after making provison for

Depreciation on Buildings and Machinery		R5,369 11
Stationary and Postages		5 00
Auditor's Fee and Management Expenses		3,050 00
		8.424 11
Less Transfer Fees ..	R22 00	
Interest on Bank Account	205 51	
		227 51
		R8,196 60

amounts to R19,351·34, and with the balance brought forward from previous year of R3,255·84, a total of R22,610 18.

This the Directors recommend being dealt with as follows :—

A dividend of 5 per cent for the year absorbing R15,000, and the balance R7,610 18, to next account.

The Directors are endeavouring to negotiate the purchase of about 160 acres land which adjoins the 52-acre clearing opened last year.

Mr. J. W. Bamforth, for many years Superintendent of Chesterford estate, will take charge from the 15th March, 1897.

It is hoped that the returns for the current season will be more satisfactory than for the past year.

The estimated crop for 1897 is 185,000 lb.

Mr. H. Creasy has retired from the Board of Directors, and it is suggested that Mr. Chas. L. Davis be elected to fill the vacancy.

The appointment of an Auditor rests with the meeting.

CARSON & Co., Agents and Secretaries
Colombo, 30th January, 1897.

THE UDABAGE COMPANY, LIMITED.

A general meeting of shareholders of this Co., was held at the offices of Messrs, Carson & Co.,

The following is the report :—

ACREAGE :

Originally purchased by Company ..	355 acres.	
Lately purchsed very suitable for Tea	785 ,,	
	1,140 acres.	
Tea full bearing ..	210 acres.	
,, planted 1894 ..	6 ,,	
,, ,, 1895 ..	2 ,,	
,, ,, 1896 ..	82 ,,	
	300 acres.	
Reserve ..	840 ,,	
	1,140 acres.	

The Directors have pleasure in submitting to the Shareholders the accounts for the year ending 31st December, 1896. The crop secured amounted to 123,385 lb. made Tea realizing R42,376·26, or an average price of cents 34·34 per lb., as against an expenditure of (exclusive of items under Capital Account) R31,317·01, or an average cost of cents 25·38 per lb.

The balance at credit of Profit and Loss Account after making provision for

	R. c.
Stationery and Printing	10 00
Balance preliminary expenses ..	314 88
Interests	1,907 40
Directors' fees and Visiting Agent ..	1,450 00
Auditor's fee	50 00
Agents and Secretaries	750 00
Depreciation on Buildings and Machinery	2,535 13
Legal Expenses	1,586 00
	R8,603 41
Less transfer fees ..	13 00
	R8,590 41

amounts to R2,468·81, and with the balance brought forward from previous year of R1,221·74, a total of R3,690·55. This the Directors recommend being carried forward to next account.

As regards the working of the Estate, the Company has been under a disadvantage owing to changes of superintendence. The Directors have now secured the services of Mr. A. F. Barn-Smeaton, under whose management considerably better results may be looked for.

During the past year, the valubable land in the vicinity of Udabage being rapidly acquired by others, the Directors deemed it advisable to secure three fine blocks aggregating 781 acres. In order to pay for this, and the cost of the opening, Debentures bearing interest at the rate of 7 per cent. were issued, but only R53,000 have been taken up, and the Company is indebted to its Bankers in the sum of R15,821·48 on which interest at current rates is running.

The Directors, therefore, propose entering into negotiations at home for the raising of a Sterling loan secured by a primary mortgage on the Company's property upon more reasonable rates than can be obtained locally, and which will permit of their paying off the Debentures and debts, and provide sufficient funds for further extensions.

The estimate for the curre t season is 125,000 of made Tea, and up to 250 acres are being felled and planted up.

Mr. J. N. CAMPBELL retires in terms of the Articles of Association, but is eligible for re-election.

The appointment of an Auditor rests with the meeting. CARSON & Co.

Colombo, 29th January, 1897. *Agents and Secretaries.*

PLANTING NOTES.

I see an outcry has been raised against the products of a tree being applied to it as

MANURE

in connection with disease in turnips at home. As usual in such cases the outcry is being re-echoed here, and people declaim against burying tea-prunings which are wrongly called "refuse." I consider that word a misnomer and would call it a product of the tree. There is no analogy between the refuse of the animal creation and the leaves, fruit or branches of trees or plants. In the one instance, the refuse is that portion of the food, which is refused by the system after it has extracted from it all that is necessary for its sustenance. According to this definition trees and plants have no "refuse" or excreta. Old agriculturists believed that plants passed through their roots what was not necessary for their sustenance, and that this "refuse" was harmful to that order of trees and plants, and that after a time, they refused to grow on the same land. This was the beginning of rotation of crops. This is an instance of right conclusions being drawn from wrong premisses. The practice that observation led agriculturists to adopt, scientific research has pronounced to be the right one, but for different reasons. The soil is deprived temporarily of certain constituents by one order of plants, but another order not requiring the same constituents thrive well enough on the same soil. As you very pertinently remarked, forest soils are improved by the dropping of leaves.

Old coffee planters used always to bury prunings when the labour was available and

PULP

never went to waste, but was a valuable ingredient of comport heaps. Sabonadiere, an acknowledged authority in coffee planting, wrote :—"Pulp is a very useful manure. I have found pulp most beneficial, mixed in equal proportions with cattle manure, the effects seem to be equal to cattle manure alone." Of prunings, he writes:—"Prunings make a very good vegetable manure, they should be buried in trenches when still green." George Wall, another acknowledged authority, and who had besides a scientific knowledge of agriculture, wrote :—"Prunings are a very useful manure." It might be urged that this application of the "refuse" of the coffee tree to it was one of the causes, if not the cause of leaf disease. I leave that question for scientists to answer.

"C. A. C." in your columns, who affects to write with authority, says, that he pointed out to ignorant native agriculturists the folly of applying to coconut trees their "refuse" in the shape of husks and branches. He instances the "Moss," belonging to the late Mr. Maartensz, where husks when dug out after being buried for a large number of years was found to be undecayed. It does not seem to have struck this authority that the soil of the "Moss" is sandy, and sand is a preservative agent when dry and what little decay of vegetable matter takes place in sandy soil is when it is damp and this only in wet weather. I buried husks in a clayey soil, and when I dug the spot three years after there were traces only of the husks, and the soil where they were buried was a dark-coloured loam. *Moral.*—It is not safe to generalize on insufficient data.

My observation goes to show that not only does sandy soil dry up quickly, but vegetable substances on it seem to have the moisture in them extracted by such soil. Dry coconut branches heaped up on sandy soil become quite dry and crisp when a few days of dry weather follow a season of wet weather, while those heaped on more retentive soil, get quite decayed and crumble into pieces after wet weather. "C. A. C." may be interested to learn that another authority and as eminent as he, recommends the burial both of branches and husks of coconuts. I refer to the veteran and experienced coconut planter Mr. W. B. Lamont, whom perhaps the infirmities of age have made to rest his facile pen. He and Mr. Jardine could attest to the value of nuts as an application to coconut trees.

TOBACCO PLANTING

for Europeans as an industry is again being discussed. It is a garden cultivation and as such is very expensive if carried on with paid labor and will not yield adequate returns to Europeans. I believe the system adopted in the Straits is for each Chinese coolie to be given a certain number of plants to tend, and payment is made according to the number of plants successfully tended, *i.e.*, payment is by results. If I mistake not, Messrs. Don VanCuylenberg and Mark Maxfield were both engaged in tobacco cultivation—the Straits and Sumatra—and they would be able to speak with authority on the style of the cultivation, cost and results. On the Western and North-Western Provinces the system adopted is for the tobacco fields, usually sandy tracts, to be manured with cattle and moveable pens. The droppings are not turned in at once but lie exposed on the surface to our tropical sun and rain. The former must dissipate a good deal of the ammonia and the latter, especially in the North-East rains like those we had at the end of last year when the tobacco lands became quite swampy, wash it out of the not very retentive soil. Well, after months of exposure to the sun and rain, the manure is ploughed in with native plough or dug in with mamoties, and the land is prepared for planting. It is lined and little holes are dug out for the plants, and these are put out and shaded. The real hard work commences now, the plants are watered morning and evening, vacancies are supplied, the ground, which becomes hard and pressed down by the constant action of the feet, is now ? at frequent intervals and is weeded, "poochies" are removed from the leaves, and the plants are manured with well-rotten cattle manure, and otherwise tended till they are fit for topping. Then the work becomes more laborious as suckers have to be constantly removed. In fact, the attention required is unremitting till curing commences. When the plants are fit to be cut for curing they are sold at prices varying from from R50 to R75.

I shall, when time permits, give you my experience as a grower of Tobacco for light cigars and for native chewing.

B.

INDIAN PATENTS.

No 81 of 1897.—Amended application. See No. 6 of 1897. Specifications of the undermentioned inventions have been filed under the provisions of the Inventions and Designs Act of 1888 :—

Improvements in apparatus for drying tea.—No. 345 of 1896.—William Alfred Gibbs, gentleman, of Gilwell park, Chingford, England, and Gilbert William Sutton, Civil Engineer, of Rothmans, Great Baddow, Chelmsford, England, for improvements in apparatus for drying tea and other substances. (Specification filed 17th February 1897.)

Machine for Drying Tea and analogous Substances.—No. 390 of 1896 :—Henry George Hills, Tea Planter, Silcoorie Tea Estate, Cachar, for a machine for drying tea and analogous substances. (Specification filed 22nd February 1897.)—*Indian and Eastern Engineer*, March 13.

GUTTA PERCHA IN DUTCH GUIANA.

The Foreign Office has recently issued a Report by Consul Churchill on the Balata industry of the colony of Netherlands Guiana, which is of interest to Forest officers in India, as it shows that the list of trees which yield gutta-percha or indiarubber is by no means complete.

Balata is a kind of gutta-percha obtained from the milky juice of the bark of the bully or bullet-tree, *Mimusops Balata*, a large forest tree belonging to the order *Sapotaceæ*, which ranges from Jamaica, and Trinidad to Venezuela and French Guiana. Although the tree has been known for years past, and its wood, which is very hard, largely used for sugar-mill rollers, machinery and building purposes, the collection of the juice for the manufacture of guttapercha is of quite recent origin, and it is to this point that we wish to draw attention, as there are probably a number of trees indigenous to India which are capable of yielding gutta-percha in paying quantities. The matter is worth the attention of Forest officers, especially of them in charge of evergreen forests in the Southern Provinces. In connection with this, we would invite a reference to a letter from Mr. Lushington, printed in this month's issue, and to the genera mentioned by him would add *Isonandra*, which also belongs to the order *Sapotaceæ*.

We reproduce below some extracts from the report in question :—

'The bullet-tree is found in (Netherlands Guiana) in greater abundance in the low-lying zone of fluvio-marine deposit. It is also found in the higher lands of the interior, but in a less abundant and more scattered condition. On the bullet-tree bearing grounds in forest, where they are plentiful, the observer may see from 20 to 30 trees of a thickness of 12 to 30 inches within a radius of 100 feet around him, where this tree is less plentiful, the observer will only see two or three trees within the same area. The bleeder usually looks over his head and discovers the tree by its foliage. He also knows that the bullet-tree must be near when he comes upon certain kinds of bush. Above a trunk thickness of about 30 inches the tree is usually not worth bleeding.'

'The tree often grows in zones or belts, on which it prevails in excess of all other trees. The limits of these zones or belts being crossed, the forest may be traversed for hours without a single bullet-tree being met with, after which perhaps another zone is run into.'

'Regarding the character of balata, Mr. Jenman quotes Dr. Hugo Müller, F.R.S., as follows':—

"Although my own opinion about balata, derived from personal experience, of its practical application in a few instances was entirely favourable, I thought it desirable to avail myself of an opportunity of obtaining further opinion direct from an indiarubber manufacturer, considering that this would be much more to your purpose than anything I could say on my own account, hence the delay in my answering your letter.

"It seems, then, that balata is by no means neglected, and, in fact, it would find ready purchasers if more of it came to the market. As it is, the supply is very limited, and generally it comes only once a year. It commands a higher price than gutta-percha, and this in itself is a proof of its usefulness. It is used almost in all cases in which gutta-percha is used, but on account of its higher price only for superior purposes.

"It seems that balata is treated by the manufacturers simply as a superior kind of gutta-percha, and, therefore, its name disappears when manufactured."

'Nevertheless, balata is distinctly different from guttapercha, and this is especially manifested in some of its physical characters, for instance, it is somewhat softer at ordinary temperature, and not so rigid in the cold."

"The chemical composition, however, is probably quite identical with that of gutta-percha and of caoutchouc."

"In one respect balata shows a very marked and important difference from gutta-percha, and that is in its behaviour under the influence of the atmosphere, whilst gutta-perch when exposed to light and air soon becomes altered on the surface and changed into a brittle resinous substance, into which the whole of the mass is gradually converted, in the course of time balata, on the other hand, is but slowly acted upon under the circumstances."

"I inclose a piece of balata tissue which has now been in my possession quite six years, and although it shows a peculiar mealy efflorescence due to chemical change, it is still supple and coherent. A similar tissue of gutta-percha would have long before now become entirely converted into a brittle resin."

"The electrical insulating quality of balata is said to be quite equal to that of gutta-percha, and altogether there seems to be no question about the valuable properties of balata. All that is wanted is a sufficient and constant supply and a somewhat lower price. But even at its present price, I think, it would find a ready market if it came in large quantities, and thus enabled manufacturers to use it for applications on a large scale. As far as I could make out, it is used by itself and not mixed with gutta-percha."

'The balata industry of this colony is in its infancy. In Surinam the forests which have been bled are abandoned, and new lands are sought for and exploited up to date. Only those areas where an abundance of trees is to be found have been selected. On areas where 100 trees are found it sometimes happens that about 75 per cent only give milk at the particular period when the bleeder visits them, and that at some later period the remaining trees will also run ; but as the bleeders have gone beyond that particular section, it is not profitable to come back and bleed the remaining trees just at the special time when they are ripe for it.'

'The forests are all the property of the Crown, and are leased by the Colonial Government at a rental of 10c (1d) per hectare per annum for the exploitation of balata only, and that in conformity with the Balata Ordinance of the colony.'

'There is no export' duty whatever.

'The bleeder receives advances from his employers against which he contracts to deliver balata. For his balata he receives from 50 to 55c. (10d to 11d) per lb., delivered on the concession, An average bleeder will gather about four gallons per day. A very successful bleeder may get as much as 10 gallons during the same period. In Surinam a bleeder will gather an average of 1 gallon per tree, bleeding from the base of the tree up to a height of 20 feet and scarifying the back to half its circumference only, further sacrification being illegal. A gallon of milk will dry to about 4 lbs. of balata."

'The bleeders are mostly recruited from Berbice, in British Guiana, and about 1,000 men are at present employed in this colony in the industry.'

'The hot and very wet seasons are not good for balata bleeding. The trees blossom in August, and the seed drops about the month of November, when the new leaf shoots out. By the end of January the

milk obtains the condition when it runs most plentifully. The leaves of the old trees, the milk which is not easily getable are dark-brown on the lower side and green above, the younger trees are light green on both sides. During the flowering season the milk does not flow to any paying extent. The leaves of the young trees are thick, and, when broken, the milk issues freely from the wounds. After the month of August to the middle of January no work is done, this leaves about eight working months.'

'Balata cannot be purchased in the market in Paramaribo. It is only gathered for those who employ balata bleeders, therefore, no quotation as to its price can be given, although it will be seen from the statistics of the exportation of this commodity, which the Colonial Government have very kindly placed at my disposal, that for statistical purposes a valuation is given. The only certain thing that is known is, that the bleeder receives from some employers 50 and from others 55c. per 1 lb. for the balata which he produces on the concession. Beyond this, however, there are other expenses which must be added, such as commissions to foremen, loss by runaway bleeders, deaths, thefts, loss by capsizing of boats. cost of transportation, surveying of concessions on occasions of dispute as to boundaries, assistance of pilots, Indian trackers, &c.'

'RETURN OF BALATA EXTRACTED FROM THE COLONY OF NETHERLANDS GUIANA.'

Year.		Quantity. Kilos.	Value. Florins.
1889	..	1,509	1,509
1890	..	76,326	95,407
1891	..	95,587	143,381
1892	..	120,680	181,019
1893	..	32.546	65,092
1894	..	108,286	216,573
1895	..	133,681	267,362

—*The Indian Forester.*

COFFEE PLANTING IN HONDURAS.

We have before us an interesting little *brochure* of 24 pages on the above subject, in which there is a strange omission of the date of publication by the American Company that published it. There is no reason to believe that it is of earlier date than last year, though the latest date of the documents from which it quotes is 1894. It is a publication put forth by the Honduras Planting and Trading Company, with the object of setting forth the attractions generally of Honduras as a spot for the investment of capital, and specially the qualifications of the Company as a guide to those seeking investments. Though the Company counsels large investments, and would almost seem to discourage small capitalists—whether through its own dicta or through the opinion of Consul Peterson whom it quotes—it does not profess to have, or to have had, the command of unlimited capital. Thus, while we find on page 10 that no one should "attempt to do a paying business in Coffee-raising in Honduras" on less than $25,000 to have a plantation of 125,000 trees, and "double that amount would bring in much better returns"; the Company itself was incorporated with a capital of but $100,000, and it owns "a coffee farm of only 100,000 trees"; and it is the experience gained from these which has induced it to invite others to join them in plucking the golden fruit. From the mention of trees as a prime element in the calculation, our readers will infer that the system of planting which finds favour in Honduras is different from that which obtained here, and even yet obtains in the remnants of the industry which once represented the wealth of the country. Such inference would be correct; but before we proceed to discuss differences in the system of planting, we must point out that the Honduras treated of in the booklet is not the British Possession, which represents only about 7,000 to 8,000 square miles, but the extensive Central American territory, out of which that slice had been carved just 99 years ago. Here is a description of the territory on page 13 of the pamphlet :—

If the reader, looking over a map of North America, will pause at a point just south of Mexico where the continent begins to narrow down preparatory to forming itself into the Isthmus of Panama, he will notice five small divisions, each having a different color denoting one or other of the five Central American Republics. The largest of these patches of color, running from the Caribbean Sea on the Atlantic side to the Gulf of Fonseca on the Pacific, represents the Republic of Honduras. Its two sister Republics, Guatemala and Nicaragua, are on either side, while sandwiched in, and looking as if they had each preempted a piece of ground from the others, are the two smaller countries of Salvador and Costa Rica.

And if any reader feels any doubt after its perusal that the Company is an American one, the following from page 14 (apart from the single *l* in traveller) should place the matter beyond all doubt :—

The name Honduras, meaning "land of heights and depths," is so aptly applied that it is almost the first thought forced upon the traveler's attention as he makes his way into the interior. Quoting the same author again, we find him commenting upon this fact in these words: "When the greater part of all the earth of a country stands on edge in the air, it would be invidious to designate any one particular hill or chain of hills. A Honduranian Deputy once crumpled up a page of letter paper in his hand and dropped it on the desk before him. 'That,' he said, 'is an outline map of Honduras." These mountains, ranging in height from 1,000 feet to 6,000 feet, and the deep valleys between them, afford climatic conditions varying from the tropical to the most temperate where wheat can be successfully grown. It is between these extremes that the best Coffee lands are found—lands where the climate is neither too hot nor too cool, and capable of producing such Coffee as to draw the following expression of opinion from the same traveler whom we have already twice quoted: "The Coffee was always excellent, as it should have been, for the Honduranian Coffee is as fine as any grown in Central America, and we never had too much of it."

Looking to the physical and climatic conditions above described, one need feel no surprise on reading of the luxuriance of the coffee grown in that region; but the Company evidently recognizes the fact that the climate and physical features of a country cannot alone attract investors, and that agricultural enterprise takes count of something more than cheap labour and facilities of transport besides. A settled Government is a most important factor in the calculation; and the difficulty arising from the tendency to unrest and revolution in the numerous Republics of the West, is sought to be met by an extract from the *La Voz del Pueblo*, which is described as one of the Government official organs. In its issue of 12th May 1894, this combination of the voice both of the people and of the Government, after warmly welcoming immigrants to its hospitable shores, thus indicates, in its sharp reference to others, the suspicions which investors might feel :—

"These men from the cities, the indefatigable

workers, who look to mother earth for the well being of their families, and through that for the general welfare of those nations where they plant their smiling and cheerful homes of work and peace, and for whom there is an increasing welcome affection and friendship in Honduras, are the opposites of those who, in a fraudulent and pretended harmony with some administrations, like that which preceded the present one, join our ranks in order to make an iniquitous bargain and disturb us with the sole ambition of filling their purses without giving a penny in return for the protection afforded them; who, the day after a social revolution, sneer at their former protectors and speak of them sarcastically, attempting all along with palpable hypocrisy to ingratiate themselves with the new power. This they cannot do with the eminently liberal Government of today. Fortunately, the few emigrants of the latter class are well known—too well known by the Honduranians, and, as experience has shown, their worst enemies are their own more honorable compatriots, who have joined themselves to the sons of this country in honor, loyalty, honesty and work which knows neither stint nor limit."

To turn now to matters strictly agricultural, we do not find any description of the particular species of coffee which is grown in Honduras; but if "the fleshy part of the berries" can be washed off in running water, without any previous immersion in cisterns, the pulp must be of a particularly accommodating consistency. Perhaps, it was not intended that the curing process should be described with fullness and accuracy; only that the cost of bringing land into cultivation should be correctly set forth, and its profits estimated with reasonable approximation. The seedlings are transplanted when 2 years old into what is called a grove—so that shade is probably preserved—and are put down 500 to the acre—about the same as Liberian—as against 1,200 to 1,700 for Arabian Coffee. Against our 3 feet for Arabian, Honduras Coffee is topped at 5½ to 6 feet which is rather higher than the Liberian variety is cut down to; and the effect of the pruning is said to raise the yield from 1 or 1½ lb. per tree to 4 lb. on an average. But surely the trees, two years when put down, should begin to bear before the fourth year of planting out, but we are told that it is only in the fifth year the bearing:—

Generally averages from ¼ to ½ pound. From this on, the yield is doubled each year *i.e*, in the sixth year the return will average about 1 pound; 2 pounds in the seventh year, and 4 pounds in the eighth to tenth year, after which the trees will continue in full bearing for at least 30 years.

That, "under proper conditions of soil and climate" coffee has "few if any natural enemies," reads almost like fiction after our terrible experience; but it was not till the end of the "seventies" that we began to think much of our enemies. The estimated yield per acre, 2,000 lb. off trees 5 to 6 feet high, planted well apart in "rich, black loamy earth" on which virgin forests had flourished, is by no means outside the range of probability for a limited acreage well cared for; but the expectation of 100 to 300 per cent profit can scarcely be realized on large ventures. This, however, is what Consul Peterson, late of Honduras, says in the United States Consular Reports for 1894:—

The soil, climate and conditions in Honduras are equal in every respect to those of Guatemala, Nicaragua, or Costa Rica, where the Coffee industry has already reached large proportions. The only drawback in Honduras is lack of means of transportation and facilities for shipment to the coast. At present, there is practically no exportation from Honduras, the product of the plantations being readily sold at home. I have known the price of coffee, even in time of peace, to reach the sum of forty (40) cents (gold) per pound and in time of war as much as seventy-five (75) cents, to notwithstanding the splendid adaptation of the country to its production. The Honduranian Coffee is equal in every respect to the Mexican, Guatemalan, or Costa Rican product, and is well-known to be of a superior quality, commanding a price in the great markets of from twenty (20) to twenty-five (25) cents per lb. A new plantation of coffee will commence to produce a profit by the end of the fourth year after planting, and after the seventh year a profit of from 100 to 300 per cent. on the capital invested may be expected. The average cost of the production of coffee, after the plantation is well started and five years old, will not exceed seven (7) cents per pound. The preparation of the land for a coffee plantation will consist only of clearing it off well and keeping it clean. The young trees are to be secured from a nursery, and cost from $10 to $20 per thousand. Nurseries, of course, are maintained on every plantation. The young trees are planted from twelve to fifteen feet apart, in regular rows, like an orchard in the United States, and the holes are dug about one foot square and fifteen inches deep.

Then the Consul proceeds:—

The following extract, taken from the *Two Republics*, of Mexico, applies so exactly to the conditions in Honduras, that, with some slight changes, I reproduce it here: "All expenses of cost and planting 1,000 trees are estimated at $100; their keeping and attendance during the three following years, or until they reach the bearing age, at from $80 to $100 per 1,000 trees. During the third year, the plantation produces sufficient coffee to pay expenses. The outlay for every 100 pounds of coffee prepared ready for market does not exceed $7 as a maximum price, the market price of which is, at the present time, $20 to $22 per 100 pounds. The value of coffee plantations in full bearing is calculated at the rate of $1 per grown tree, a single acre producing from 400 to 500 trees, which price only serves as a basis of purchase, as it includes, besides the land and buildings, cattle, implements and machinery. Much of the labor required for the cultivation and preparation of Coffee is performed by women and children, which largely increases the labor supply and reduces the cost, the average being thirty (30) cents per day. The season for planting commences in April and ends in November, but plants raised from seed require eight months to mature before they are ready for transplanting to the field in which they are finally to grow. "The altitude best suited for Coffee culture is from 1,000 to 4,000 feet above sea level, that is, up to what is termed the frost line. If the soil be rich and deep, 500 trees to the acre is a sufficient number. Results have been found more satisfactory with this number than with a greater or less number of trees per acre. The Coffee districts are also among the healthiest in the country, and the climate suitable for Coffee-growing is adapted also for persons accustomed to living in a temperate zone. "The soil and climate suitable for Coffee-growing are also adapted for the cultivation of tobacco, corn, beans, bananas and oranges, and in the lower-lying districts for sugar cane, rice, and most tropical and subtropical fruits, the growing of which is made accessory to Coffee culture. The pineapple is the least expensive and the most profitable, especially where the planter has close and cheap transportation to the gulf ports." To the last paragraph of the above extract might be added the fact that a rubber-tree can be placed in the centre of each square of twelve feet, which, in the course of a few years, would vastly augment the income and profits of the plantation.

We do not apprehend the desertion of our Tea enterprise as a result of the publication of these figures; but it is well to know how people are impelled by great expectations. We may mark for extract in another issue the experiences of the Company itself as told in these pages.

PLUCKING, PRUNING AND PREPARATION OF TEA.

Just as we were printing off our Circular, making inquiries under the above heading, the following letter came to hand :—

"The Back Woods," Feb. 6, 1897.

The Editor "Tropical Agriculturist."

DEAR SIR,—As the manure campaign is now over, I should like to introduce another, and equally important matter of culture, viz: Pruning Tea Bushes, and to get your and other opinions thereon.

With the usual system of pruning, that is leaving a spur of two or three inches of the young wood, from which the young flushing shoots spring, though much can be done, and is done by careful cultivators to keep the bushes from getting too high or too lumpy by the healing up of many pruning cuts, still there are cases, when it becomes advisable to cut down into the old wood, and from it, to get a new bearing surface.

This is done, as a rule, with much greater moderation than it was some years ago; but on some estates, there is still to be seen the ruthless cutting down or hacking in almost to the collar, and curious enough, I never yet met with any of those who practise this: what we sometimes hear called—heroic cutting down. Who could give a substantial and intelligent reason for it. Some of the evil results, in my opinion, are these :—the bushes are reduced to a much narrower surface, and, in most instances, they never regain their former condition ; unless possibly in strong rich virgin soil, or if heavily manured with bulk, and even then doubtful.

The shock to the bushes is so great that some of them die outright—other parts, a side or a quarter, more or less as the case may be. The dead or dried and stunted stumps are—especially in the lowcountry—the prey of white ants.

There is greater waste of material in the quantity cut away, loss of time, and of course of returns, before the bush is in bearing order again ; add to this, that months pass before the tea is equal to its former quality.

With these evils and others that might be mentioned, is it not remarkable that this harmful system finds favour with some good heads, even yet. Were tea not a more than ordinarily hardy shrub, there would have been less to say now about over-production.—Yours faithfully,

ARBOREAL.

The questions in the Editor's Circular run as follows :—

Would you kindly—as briefly as you please—give us your opinion on the causes which have brought down the average prices for Ceylon teas of recent years in the London and Colombo markets?

(1) Would you say how far you think Coarser Plucking of Leaf may have had to do with?

(2) Or the more prevalent attention to Manuring Tea?

(3) Or severe Pruning—cutting the bushes too far down?

(4) Or less attention to care Preparation in the Factory?

[Some say good tea is made in the field ; but we suppose careless or inadequate factory work may spoil the most carefully plucked leaf?]

(5) How far Shortness of Labour Supply has affected your work in field or factory?

(6) Any other cause that strikes you—apart from

(7) Overproduction and Increased Supply in Competition at the Sales?

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We now begin to give the answers which embody a great variety of useful opinions and information from some of the best-known planters in the island :—

No. I.

The country generally.

Answering your questions briefly, I do not think coarser plucking is being adopted over any extensive area, nor do I think manuring has any thing whatever to do with lowering prices.

Severe pruning deteriorates quality no doubt for a time, but how are we to get a low jât bush to flush at all, at medium elevation (3 to 4,000 feet) without, at intervals of 3 to 4 years, cutting down.

We all know that fine leaf makes fine tea, and I certainly do not think that less care is being given to manufacture now than in previous years. What are undoubtedly defective on many estates are withering arrangements—these on many properties that I know are most faulty and quite inadequate to cope with quantity of leaf coming in. I am glad to say there are signs all over the country that this is being recognized. I visited several estates lately where the superintendents had leaf spread 1 foot deep in the rooms of the bungalow !

In my opinion we must mainly attribute to increasing supply, the lower prices of the past 2 years. When stocks run down in London and demand gets brisker, we shall not hear so much of "poor quality and little flavour !" R. A. B.

No. II.

No. 1.—Planters, who have failed to get good or leading prices, may have gone in for a system of plucking to get quantity, and thus to some extent have helped to bring down the average prices for Ceylon teas.

No. 2.—I do not think that manuring has had any influence whatever in reducing the rates.

No. 3.—Heavy pruning, I am inclined to say, does interfere with the quality of our teas for 6 to 10 months after cutting down or until such time as the bushes get on a full cover again.

No. 4.—Managers are all keen on getting the best prices they can, and, with the additional experience which has come with recent years, they endeavour to make the best of the leaf that the estate produces. I cannot say that I have observed or heard of less attention being given to careful manufacture than used to be when the majority of estates were getting lighter averages.

No. 5.—Shortness of Labour does to a great extent interfere with good and careful plucking as well as manufacture; but so far I have never myself had cause for complaint under this heading.

No. 6.—Increased production has doubtless more to do with the downfall of prices than all the other factors put together. It is now some 12 to 15 years since tea planting was commenced on a large scale in this and other coffee districts, and at that time we were under the impression that about 300 to 350 to 400 lb. would be outside returns per acre per annum to expect. It is true some poor old fields only give the lower average, whereas the better and manured fields yield double.

MID DIMBOOLA.

No. III.

THE FALL IN THE AVERAGE OF CEYLON TEAS AND ITS CAUSE.

(1) May possibly affect individual average ; but I think the plucking, generally speaking, is finer than it was say 5 years ago.

(2) Not much, if any.

(3) Do. do.

(4) With more commodious factory and greater knowledge, I think the work in factories generally is more carefully done today than ever it was.

(5) When an estate finds itself short of labour part is generally abandoned and the rest plucked as usual, so I do not think that this affects the average,

(7) Overproduction is, I think, the only cause that is worth considering, and that this exists, so far as the London market is concerned, is proved by our having to find fresh outlets for our produce every year.

Of course individual exceptions go to prove the general rule.—Yours truly,

DIMBULDANDAOYA.

No IV.

High District.

(1) Not much; plucking is about same as it used to be.

(2) Not manuring certainly; witness (Hautville) prices in Agrapatna; Dewetnrai in Low Country.)

(3) Pruning could be more scientifically done than it is in many cases, and both yield and quality of crop improved.

(4) This is where we are weak, and even the Java planters have in conjunction with Government a scientific chemist helping them, their prices are going up, ours down !!

(5) Not much.

(6) Overproduction is at the bottom of lower prices and things will be worse yet. "N."

No. V.

Ramboda.

1. I think Coarser Plucking has had something, but not much to do with it.

2. I do not think that Manuring has injured the teas.

3. Severe Pruning is periodically necessary, say once in 10 years, and I think there cannot be any doubt about the teas being weaker for a considerable period after heavy Pruning :—for the first 8 or 10 years of our tea industry heavy Pruning was not required.

4. I think more attention is now given in the Factory than formerly.

5. We have always had sufficient Labor here.

6 I think the chief cause of the fall of prices is, that the taste of buyers has changed of late.—L.

No. VI.

Medium District.

1. I do not think Coarser Plucking has anything to do with the bringing down of the average price.

3. I believe severe Pruning is a good deal to blame for inferior quality of leaf.

4. And I am perfectly sure if more care was given to Preparation in the Factory the average would keep up. Many estates cannot make good tea for want of accommodation. Tea is made in the factory, very little in the field.

5. Shortness of Labor Supply has not affected field or factory work. V.

No. VII.

Dimbula, Feb. 15.

In reply to your circular the fall in prices is due mainly, in my opinion, to Overproduction.

1. At the same time from exigencies of labour Plucking has a tendency to be less carefully done than a few years ago.

Theoretic Plucking is also done (as a rule) much less finely than a few years ago, and the extra yield fully compensates up to this date for any diminution in the quality and price of the resulting tea.

2. *Manure* does not (to my mind) injure prices to any great extent, although it does affect flavour in individual fields for a few months especially in wet weather.

3. *Pruning.*—Severe pruning—I have no established opinion on this point, but am inclined to think that severe pruning would affect prices much as manuring does for a few months. I do not think pruning generally is in any way responsible for the present drop in prices.

4. *Factory Preparation.*—It is impossible for any factory staff to handle a heavy crop as carefully as a light one—a certain percentage of leaf *must* be underwithered and overwithered, and indifferently fermented (in spite of every care being taken by the teamaker) if the crop is a heavy one harvested in damp weather.

5. Up till now, shortness of labour has not affected me personally, but has undeniably done harm generally—the shortness being rather in field than factory.

6. Seasons vary considerably, and I consider that the crop of 1896, following on the heavy crop of 1895, and being in itself large, can hardly be expected to produce so good a price as was realised in 1895, following upon the short crop of 1894. A certain measure of exhaustion of the finer principles of tea must result in the second of two heavy flushing years, and continuous and monotonous work makes the whole staff have a tendency to get "stale." BOHEA.

No. VIII.

Answers. Ambagamuwa.

(1) The chief of the causes.

(2) No.

(3) Yes, to a great extent, but we *must* prune hard.

(4) No.

(5) During April and May, a great deal of rubbish is made on account of strained resources, both as regards field and also factory work. If flush be left too long and the planter gets behind with his rounds, then the leaf that comes in makes bad tea. So also in the factory, when the factory arrangements are unable to cope with the great rush of flush. Night work means, as a rule, inferior tea. But all this lasts but two months.

(6) Played out land, poor soil, general state of the money market and trade in general.

(7) Increased production and congested sales causing unfair competition.

We would have better prices *if*—we had rich alluvial soil, more decided seasons, rest and harvest, abundance of labour, more extended markets, less congested sales. Our harvest is, like the poor, always with us, and our other works are carried out at the same time. If we had harvest time for a short busy season, when all operators were concentrated on manufacture—and then a long easy season when pruning, and manuring could be leisurely proceeded with then we might do better. 1897.

No. IX.

Talawakele, Feb. 15.

Dear Sir,—With regard to your questions :

(1) I am certain that coarser plucking has nothing to do with it. Plucking on the whole is much finer than it was five, six and seven years ago.

(2) It may be that manuring has caused some little deterioration; but I doubt it, as manuring has certainly not been generally overdone and it gives a vigorous bush, and a vigorous bush gives tea with quality.

(3) I am certain that "severe pruning,"—but I do not say that the severe pruning may not in most cases be necessary,—has everything to do with this fall, except what is accounted for by your 7th heading and, perhaps, under your 6th heading, by competition with increased prices in plucking in India.

(4) I believe that as much care is used in the manufacture as formerly with more knowledge and better machinery.

I fear there is nothing to be done *here* except to make the best of a still very passably good job.

Tea must sooner or later be heavily pruned and afterwards the results are never quite so good in quality as previously. B.

No. X.

Dimbula, Feb. 15.

1. Coarse Plucking will undoubtedly lower the quality of tea; but careful plucking is now the rule and the bud and two leaves plucked.

2. Having no experience in manuring, I cannot say if quality is affected by it or not.

3. Cutting bushes too far down may affect quality for a long time as even after the usual pruning leaving 2 or 3 inches of young wood above last pruning, it takes six months before quality and strength are in the leaf.

4. I am of opinion that preparation in the Factory is more careful now than it used to be, owing to increased withering accommodation and more machinery. Certainly you must have good leaf to work upon, and the best leaf may easily be spoiled by carelessness or want of withering space and machinery.

5. Shortness of labour soon tells on quality and quantity. Regular and systematic plucking gives the best tea, and if from want of labour your 8 to 10 day round takes 15 to 20 days, the quality of leaf soon is spoiled and the quantity is lessened.

6. Perhaps a too general publication of the cost of production of tea may tend to keep down prices. JAY.

No. XI.

High District, Feb. 15.

Dear Sir,—Formerly the bulk of our tea came from old coffee estates at above 2,500 feet; but, of late, a very large proportion of low country tea at low prices has reduced the average. Large yields of coarse leaf, where quality is not obtainable, of course, gluts the market with low-priced trash. Factory supervision is of more importance than field supervision as the former checks the latter as far as plucking is concerned. Where shortness of labour means borrowing from neighbours and Sunday plucking, the quality is bound to suffer.—Yours faithfully, N. C. D.

No. XII.

High District.

Factory has accommodation for ½ million lb.

1895	318,000 lb.	sold for 1s 0⅞d
1896	340,000 ,,	,, ,, 1s 1⅜d

No change in system of plucking.

(1) This can be ascertained by a comparison of grades.

(2 & 3) Does not affect quality as far as I know.

(4) Preparation in the Factory is MOST important and I scarcely know of a building which has *always* sufficient withering space and machinery.

(5) Overstocked with coolies.

(6) Starvation wages paid to Superintendents and the mistaken idea that anyone can make tea. B.

THE PLUCKING, PRUNING AND PREPARATION OF TEA:

REVIEW OF LETTERS I TO XII.

If the questions contained in the first circular we sent out, bearing on our great staple, may be said to be suggestive of the dictum, that good tea is made in the field, the second set of questions circulated by us may be interpreted to favour the theory that the factory is responsible for the quality of the tea that bears the estate mark. We must disclaim either theory as our creed, as also all intention of drawing a sharp line between cultivation and manufacture. Indeed, the remark between parentheses in our second circular, between questions 4 and 5, would indicate our recognition of the interdependence of field and factory work; while, it will be observed, that more than one question in the second circular has reference to field operations. The fact is that neither field nor factory alone can produce good tea, and our chief concern is with the tea industry as a whole, and the object of our inquiries is to elicit information which will be helpful to planters in their endeavours, while securing from their estates the highest possible yield without injury to the bush, to maintain a high level of excellence for the tea they produce—in other words, to obtain the best possible prices. The effect of the mass of interesting matter which the first circular brought to a focus, from districts varying in every possible way—in soil, climate, elevation and fertility—is to establish that the outturn of the acreage already planted can be appreciably increased—say to the extent of 25 per cent at least—by liberal cultivation and manuring, and without any injury to the quality of our teas—always assuming there is labour enough to apply the manure, to pick the increased crops and to carry on the manufacture. The case for quantity has thus been made clear. We have to deal now in the letters before us principally with quality and price, as influenced by a variety of considerations. The second set of questions is, if anything, more searching than the first, and the answers to them are even more interesting than those which the first circular produced.

As will have been seen from the letter of "Arboreal" the need for the second circular was recognised even before it was issued, as pruning is rightly considered a very important factor in tea production, influencing, as it does, both quantity and quality. It is curious that, while, at the outset of the Tea enterprise, Planters were half-afraid to prune their bushes, and erred generally on the side of under-pruning until Mr. William Cameron (? Campbell) about 15 years ago brought his Indian experience to bear on the numerous estates he was asked to supervise, the error now seems to be in the direction of over-pruning—hacking almost down to the collar. Of course this is done—where it is done—at long intervals of five to six years; but we know, as a matter of fact,

that a certain percentage of bushes die under the treatment; while we can quite understand that it permanently injures the weaker bushes which are seldom or never what they were before, in symmetry or plucking surface. Indeed, there seems to be a consensus of opinion that many months ensue, after such severe pruning, before the quality or flavour of the tea is what it was. This, then, is one of the causes which have led to the lowering of our average prices. "R.A.D." leans to this view; but he regards cutting down at intervals of 3 to 4 years absolutely necessary for the production of flush in bushes of low jat at medium elevations. He does not believe that manuring has contributed towards low prices, or that coarser plucking is very generally adopted; nor does he think that less care is bestowed on manufacture than formerly. Inadequate and faulty withering arrangements, he considers responsible for much of the deterioration in quality, while he notes some attempts at improved arrangements; but the chief explanation of lower prices is to be found in the growth of production. Few will dispute this last conclusion; but should not the very fact of an increasing supply suggest the need of greater care in preparation! It is not enough to say, there has been no falling-off in care. With greater experience and improved machinery we should be able to produce tea of better quality; but how is this to be done with leaf laid out a foot deep, and even the bungalow rooms utilized for withering?

"Mid Dimbula" regards course plucking as a result, rather than as a cause, of lower prices which he refers principally to increased production. When men find that the same quatity of tea brings them in a diminished income, they naturally try to increase the quantity, so as to improve their income! Neither manuring, nor inattention to manufacture, in the opinion of this correspondent, explains the fall; but shortness of labour, as interfering with careful plucking, has contributed towards it, as also heavy pruning, for from 6 to 10 months after the cutting down. And a point generally lost sight of is that, whereas 12 to 15 years ago, 300 to 350 or 400 lbs was considered an outside figure for most estates; many now yield double that, and have a corresponding lack of appliances and labour to deal with it. That, we should say, points to a form of insufficient attention to manufacture. "Dimbuldanda-oya," on the other hand, while holding that coarser plucking explains the falling-off in prices in individual cases, thinks that, generally speaking, the plucking is finer now than it was five years ago. Exonerating as he does both manuring and heavy pruning from responsibility to any appreciable degree for the fall, and holding that wider experience and bigger factories contribute to more careful manufacture, he regards overproduction as the principal, almost the only, cause of poorer prices—especially as shortness of labour, he says, leads to the abandonment of flush that cannot be overtaken, and the plucking as usual of what can be plucked. "N," too, thinks plucking is much as usual, and that manuring certainly has not told on prices—in proof of which, he refers to Hauteville in Agrapatana, and Dewaturai in the lowcountry. More scientific pruning, whereby both quality and yield might be bettered, is possible; the scarcity of labour has not told much on prices, but over-production has, and will tell yet more; while, in his view, the Factory is the weak point in our system. Our correspondent does not content himself with merely condemning preparation; he puts his finger on the lack of scientific knowledge as the blot, and refers to the upward tendency of Java tea, in the preparation of which a qualified chemist helps, while our teas are going down in price. "L" from Ramboda admits the evil influence on prices of coarse plucking, while acquitting manure of all blame. He also admits the weakening of the tea produced for many months after severe pruning which, however, he regards necessary at least once in 10 years, after bushes have attained a certain age. With greater attention than before paid in the Factory, and with no deficiency of labour in his district, the chief cause, in L's opinion, of the fall in price is a change in the taste of buyers. But would not that tell on their purchases? They do not neglect our teas. They buy more than ever they did before; but they value the teas at less. It seems obvious that they could not do this, if we produced less and the competition were keener—whether their taste was changed or not; but the question is, Is the tea the same as it was? Can we do nothing to command the better prices of Indian sorts? "V" differs from "L" as regards coarser plucking; he blames severe pruning; he acquits short labour, and holds the Factory responsible. More care and more accommodation are necessary; and very little depends on the field, if the Factory does its duty.

"Bohea" from Dimbulla admits that labour exigencies lead to faulty plucking; that manure does tell on flavour and price, but only for a short time, and in rainy weather; so also with heavy pruning; that heavy cropping in one year (as in 1896) following a large crop (as in 1895), does tend to exhaust the finer principles of tea—and even the buoyant energies of the staff through continuous and monotonous work. But, with all this, over-production, he regards, as the main cause of the fall. "Bohea" puts his case well, especially when he emphasizes the difficulty of handling a heavy crop in damp weather, and the influence of under-withered and over-withered leaf on the total outturn. "1897" puts down coarser plucking as the chief cause of lower prices, while heavy pruning, which is inevitable, also tells; but he acquits manuring of all responsibility and denies that less attention is paid in the Factory than before, though when there is a rush and night work becomes necessary, the resulting tea is bad. The poverty of the soil, the state of the money market, increased production, congested sales, and continuous plucking without decided seasons, have all contributed towards the fall.

Of the four letters "B" from Talawakele, "Jay" from Dimbula, and "B" deny coarser plucking; while the last-mentioned in one word establishes the importance of adequate Factory accommodation. His Factory is equal to ½ million lb.; in 1895 he turned out 318,000 lb. which sold at 1s 0⅞d.; in 1896 the outturn was 340,000 lb. and the price was 1s 1¼d.! The plucking was the same, the yield was larger, the prices higher. We agree that starvation wages to Superintendents should not be the reward for results even approaching this. "N.C.D." admits coarser plucking, and thinks the increase of low country estates tells on the average. In other respects, these correspondents do not differ They admit the importance of care in the Factory, but realize the evil influence of shortness of labour and irregular plucking. Manuring is not condemned; but the deteriorating effects of "cutting down" are admitted. Heavy pruning, however, is regarded as

a necessary evil; but may not manuring restore strength to the leaf of hard-pruned bushes, as it imparts vigour to the bushes themselves?

(*Letters Continued.*)

No. XIII.

Hantane District, Feb. 15.

DEAR SIR,—In reply to your circular for the reasons why prices of Ceylon tea have fallen.

(1) I don't think Coarser Plucking is the secret. Here we have steadily gone in for medium plucking, never changed it, but the prices have gone down.

(2) Manuring tea is not so general as to affect the whole production, nor do I believe that manuring does aught else than good.

(3) Severe Pruning I have no experience of. I don't prune severely but often, every twelvemonth or so. The estate is old, the soil is poor, but it is liberally manured and pruners are kept steadily at work all the year. The result as far as I can yet judge has been wholly beneficial: no falling-off in the teas, and good plucking averages, all the year round.

(4) That "good tea is made in the field" is only a half-truth. Nobody can make good tea from hard or over-grown leaf, but any one can spoil good leaf in the factory. To insure good tea requires care all round, just as to work an estate well, means attention to every detail. Plenty of withering space, and the ability to wither is a great deal.

(5) Have had no reason to complain of shortness of Labour Supply affecting either my work in field or factory. Have been stuck up with leaf that would not wither and been bothered that way, which is bad enough.

(6) Haven't an idea to offer since you prescribe "Increased supply."—Yours truly

HANTANE.

No. XIV. Feb. 15.

DEAR SIR,—In reply to your Circular of 12th:—For many years past the race has been for biggest yield per acre. With increasing estimates, Superintendents have had no choice and quality has been sacrificed for quantity.

2. Application of artificial manure has reduced price often by about 1d. per lb. Your correspondent "W. H. M." on this subject is right in saying that manure gives a more fibrous leaf, but this result is not confined to tea grown on best land. Dry tea is lighter—bulk for bulk—and outturn from green leaf reduced.

3. Low to medium elevation, yearly pruning, well cut down, gives best quality without reducing yield.

4. No, there is more care and attention bestowed on manufacture now than previously. Bad tea is made in the field—good tea in the Factory. With bad leaf good tea is impossible, field therefore responsible, in other words made the tea. Best of leaf is easily spoilt in Factory—therefore good tea means tea made in Factory.

5. Not seriously.

6. Mixed jat gives better quality of made tea than any one jat only. Better jats give bigger yields, and this added to increased and increasing acreage, manuring and coarser plucking, have enabled us to oust John Chinaman (pro tem!) and almost swamp ourselves, for, during past ten years our London average has fallen from 1s. 3d. to 8d. with only about 1d. difference in exchange.—Yours truly,

X. RAYS.

No. XV.

Medium District.

SIR,—My reply to your questions relative to the causes which have brought down the average prices for Ceylon teas would be as follows:—

1. Coarser Plucking accountable only when caused by flush running ahead, owing to scarcity of labour. Little Coarse plucking is done on upcountry estates now.

2. Certainly not due to manuring.

3. Here we have undoubtedly the chief cause. In olden days, on coffee estates, Pruning was made a *study*. Even such shining lights as G. W., A. S. (of Hunasgeriya), Fred K. and the well-known and respected brothers F. R. and W. S. gave their minds to it. Essays, long treatises dealing with every phase of the subject were written, it was the staple of argument between Proprietors, Agents and Visiting Agents and of conversation wherever planters most did congregate and whose assistants listened and learnt. Did not the great I. G. say when he first saw Haputale (referring to pruning) that nature had done everything and science nothing for that splendid district? and is not the epigram of another well-known authority and prince of real good fellows still with us "the knife is the best manure"? Yes, to go through a coffee estate in the sixties and seventies was to see cultivation, but for the poor tea tree! Crammed in everywhere, in every soil and every climate, not even spared in its tender youth, as Virgil so beautifully describes it:—

Ac dum prima novis adolescit frondibus ætas
Parcendum teneris * * * *
Ante reformidant ferrum.

("They dread the knife" indeed!) Mocked, tormented, sawn asunder, anything is good enough! "Cut it straight across" says one;" "cut it down to 8 inches" says another; "all this (pointing to the whole stem of the tree) "is no good, cut it out" says a third; "this should all be in the factory" says a fourth, pointing to the leaf left above the fish leaf. "I have found the best results from leaving only one leaf after pruning" says a fifth; and so on. Anything is good enough for the poor tea tree, which has saved Ceylon and made so many rich. Cut away, gentlemen, cut away! get your yield! force your poor trees to push out every leaf they can in their attempts to save themselves from asphyxiation, and then strip it all off—they must give you more *or die! but don't expect high prices*, don't imagine that the poor half-strangled, unhealthy, sapless wood will yield you the same luscious leaf, rich in the same components, which will be produced by the vigorous unharassed four-year-old tree. This is what has brought down the Ceylon average, Sir, and made people say, Ceylon Estates will only produce fine tea when they are young.

4. Not perhaps to inattention, but to change in method of factory work. A few years ago we rolled for 20 minutes to half an hour: the leaf never got heated and was exposed, only a couple of inches deep on cool tables till it was properly oxidized. *Now* we roll twice, sometimes three times—the whole operation, with sifting, taking from two and half to three hours, and notwithstanding every care to keep the leaf cool, fermentation begins after the first half, or three quarters of an hour, and goes on, to some extent, all the time. A little delay, a little want of smartness in getting the leaf into the driers and over-fermentation takes place. A soft flavourless liquor and a "mixed infused leaf" is

the result. "Some leaves good colour, wanting brightness—very little flavour" is the broker's report. Good tea is made *everywhere*. In pruning, in plucking and in factory—work must be good all round to make good tea—even then you can only *keep* flavour if it is there; you cannot make it.

5. Shortness of Labour has no doubt had its effect. It prevents pruning being done well, and at the right time, prevents leaf being plucked exactly when it is ready; and when you *are* behind your flush, makes it impossible to get the plucking done as carefully as it should be. An adequate supply of labour would, I believe, raise the price of Ceylon tea 1d per lb.

CUSTOS PAUPERIS HORTI.

XVI.

(1) I don't think, as a rule, planters do pluck coarser! I should rather say finer.

(2) I think it a mistake on any estate to manure good tea for the sake of additional yield; old land can often only be made to pay by manure; good land does not require it. Cattle manure, I do not think, deteriorates leaf; though artificial may.

(3) From what I do, and what I see my neighbours do, tea is not nearly so severely pruned as it was a few years ago.

(4) More attention is paid than ever before to manufacture; but a great many estates have absolutely inadequate withering accommodation and also rolling power! Things are done too much on the cheap by the proprietors of estates and they lose thereby.

(5) Shortness of labour would not affect Factory work, but in plucking; short labour means coarse plucking and coarse leaf.

(6) There is no wintering of the bush as in India, and any tree that has no rest must deteriorate, whether it produces leaf or fruit. Indian teas are stronger, though not of so good flavour; and strength is what seems to be wanted at present.—Yours faithfully,

W. I. G.

No. XVII.

MEDIUM ELEVATION DISTRICT.

DEAR SIR,—First and foremost the chief cause is that the present production is above the present requirements. Taking your questions in order.

1. I don't consider that such coarse plucking is now in vogue as previously.

2. Though manuring myself one-third of the estate yearly, I cannot see there is any falling-off in quality. I am continuing the same system as I did 6 years ago, both in plucking and manufacturing.

3. Tea occasionally requires a heavy pruning, but this is often very much overdone. No doubt the leaf plucked from this is inferior to tea taken from tea pruned higher.

4. There is very little doubt that a quantity of the tea now manufactured has not the efficient supervision, and machinery that it should have; even given good leaf it is not treated properly.

5. Labour Supply has no doubt something to do with the quality of the leaf, as if a flush once gets behind, the tea thus made is inferior to a tea made from a flush taken at the proper time.

INCOG.

No. XVIII.

Udapussellawa, Feb. 16.

SIR,—A non-teamaking neighbour has handed me your circular and asked me to answer the questions.

I. I do think Coarser Plucking has deteriorated the quality, and No. II is more closely connected with No. I than appears at first, because manured tea flushes quicker, and the flush is over-grown on the manured field if taken in regular routine as it generally is, especially now-a-days when few estates have sufficient labour to keep the flush in hand always and the effect is more noticeable in the busy months. I don't believe that manured tea really gives a worse quality of leaf *if* the flush can be plucked when it is ready, and the same rule applies to severe pruning, as the flush comes quicker, and too often we are not able to put coolies on the day it is ready, and, of course, a quick growing field suffers more through being left a few days, and the effect of this becomes more noticeable every year, as when only half the estate was in bearing, the whole labour force was available to pluck.

IV. I don't think the teamakers are any worse now, than they were; but many factories are more crowded than they should be, to do full justice to the leaf.

V. This question seems to strike at the root of the trouble. With a plentiful supply of labour and plenty of room in our factories, I believe, as good teas are made now as were ever made, but in the majority of cases, we have to do the best we *can*, not the best possible and do indirectly. I believe the application of manure does affect the price of tea.—Yours faithfully,

J. A. O.

NO. XIX.

Uva side, Feb. 15th.

DEAR SIR,—Overproduction, or rather I should say ample production, is the first and chief cause of the fall in prices, as it always is and must be in the case of all products. There can hardly be said to be *overproduction* of tea yet, as, I believe, stocks in hand are not increasing.

Always excepting above reasons I will answer your questions seriatim.

1. Yes; Coarser plucking has certainly a great deal to do with it in two ways: a larger quantity is thrown on the market, and what is gathered makes weaker and inferior tea, and too often a greater quantity comes into the factory than there is room to give to it for withering properly and manufacturing carefully. This coarser plucking has been forced upon those who were at first unwilling to go in for it. The hunger after big profits by proprietors resident in England, or in the case of Companies by the shareholders, forces the resident managers to pluck coarse whether they like it or no; prices once brought low by this cause, others found their profits diminishing, and took to coarse plucking for their own protection.

2. Manuring gives larger yields, and throws more leaf on the market, and often puts more leaf into the factory than the latter has proper capacity for. It may also cause a greater rush of leaf in the heavy flushing months than there is labour enough to pluck, and the coarser leaf resulting is seldom thrown away.

But manure may be directly injurious to the outturn of the tea, if it is done with indiscretion. Manuring with artificial often destroys the flavour and this opens another question which it would be of service to thoroughly thrash out, *i.e.*, what kinds of manure tend to destroy flavour and the reason of it. I do not think that bulky manure destroys flavour. Too forcing a manure tends to make the resulting tea weak, but there is

no reason why any manure should do so, if not applied in too forcing doses. Perhaps, the loss of flavour may be traced to the same cause.

3. Yes, I have been often told by those who have had experience that flavour is greatly lost by cutting down old bushes to 12 or 15 inches after they have reached too great a height after successive prunings; I have never heard that such bushes ever regain their original flavour Besides this, too severe a pruning is likely to act in the same way, though in a lesser degree and from the effect of which bushes would be more likely to recover. With insufficient young wood left above the previous cut, the new shoots are less likely to be healthly and robust.

4. I believe that attention to careful preparation in the factory is as great as ever it has been, if not more so, and there is better machinery. There is no doubt that different modes of manufacture will give better results than others, but there have always been different ideas and different methods of manufacture, and this has little to do with the fall in prices. Yes, good tea is undoubtedly made in the field, but not more so than in the factory. There cannot be said to be any one work in connection with field or factory which is immaterial to the outturn of good tea. Neglect in the field will neutralize care in the factory, and *vice versa.*

5. Shortness of labour need not have any effect on prices, because runaway flush often makes the best tea, provided the coarse leaves are thrown away; but very few estates can afford to do this, and the result of course is a weak and pointless liquor. In my own case, I have not hitherto been too short of labour.

6. The more leaf which is left on the bushes, the better the flavour and quality generally, but the less the yield. Many estates now keep their bushes as low as possible for the purpose of forcing the yield, which invariably results in a loss of flavour and strength; they may get a higher yield and perhaps bigger profits, but the tea made is not so good. G. H. G.

XX.

So far as the Matale West district is concerned, I think most of us have plucked coarse, because we found it pay best. I doubt whether any one in the West Matale district plucks fine. The reason is, I think, that we find we can get quantity by coarse plucking, which gives us a very satisfactory profit. Were we to pluck fine, owing to want of flavor, our prices would, in my opinion, increase very little, but our yield would go down very largely. At present the places in the Matale valley are giving from 700 to 1000 lb. per acre, and I have very little doubt, that if we plucked finer, we should make less profits. A very well-known planter and proprietor, some years ago, was advised by his brokers to try and copy Hoolankanda teas, which at that time topped the marked. He wrote back that he would be very glad to do so, if the brokers could show him, that it would pay him better to get 2s. for his tea, than 7½d. This appears to me to hit at the chief reason of the fall in price as compared with India. I am inclined to think that most low-country estates have tried more for quantity than quality, because it gave the most satisfactory results. I certainly think that more careful plucking would raise our prices, but I do not believe it would compensate for the loss in yield. T.

THE PLUCKING, PRUNING AND PREPARATION OF TEA:

REVIEW OF LETTERS XIII TO XX.

It will have been seen from our summary and review of the first twelve letters on the above subject, that Planters from all districts are agreed that attention to all the three P's which appear in our heading are as essential to the manufacture of good tea, and the maintenance of our reputation in the market, as are the historical three P's of our late Governor, to success in life, or at any rate to the character of a businessman. Without proper pruning, the quantity and even the quality of flush is prejudicially affected; bad plucking, whether through carelessness or lack of labour, is fatal to the turning out of good tea; and the most scientific pruning and intelligent plucking will be thrown away, unless the Factory does justice to the produce of the field. And how much is included in the word preparation or manufacture! Everything from the weighing in of the green leaf to the weighing out and taring of the chests—including withering, rolling, sifting, firing, re-firing, re-sifting and packing: can all these things be possibly accomplished by rule of thumb? Where all the conditions are normal—the leaf having been well plucked in good time, the withering accommodation being sufficient, the weather being favouradle for even withering, and all the machinery in good order—no higher intelligence than that of the Factory kangany may be necessary to turn out a good break. But one or other of these conditions constantly varies; and more than ordinary intelligence and powers of observation are necessary to meet varying conditions; and "N's" reflection, that in Java science is available in the Factory, and is followed by better and improving prices, deserves some attention. We have ourselves always favoured the employment of an Agricultural Chemist, and we are confirmed in our opinion by the notes which have reached us of Mr. Crole's Lecture at the Society of Arts, in which it is not difficult to discover in an abundance of technical and high-sounding words and phrases, observations and counsel of the widest practical importance. They tend to establish, what all practical Planters believe—though they may not be able always to practise what they believe or to explain what they wish to practise—that the dictum that good tea is made in the field is true only in the sense that the best equipped Factory cannot make high class teas from sapless and badly plucked leaves. The Factory is of importance, not alone as a repository for the many and delicate processes necessary for the manufacture of tea, but also as a check on bad work in the field—that is, on bad plucking. It is helpless, however, to do aught in respect of leaf deficient in the principles essential to good tea; and it is there that science should come in—to tell us if the flavourless and sapless leaf can be improved, and if so, how. We refuse to believe that science cannot help us in restoring to the soil what has been drawn out of it, so that the leaf may be reclothed with the properties which produced good Tea from the young and unexhausted bush.

So much by way of preface to our notice of the letters 13 to 20 of the series, which we published last week. "Hantane" repudiates coarse plucking, and, like many another, claims an improvement in plucking; he does not believe in deterioration through manuring; he has not been short-handed; he does not practise severe

pruning, but prunes once a year; and though the estate is old and the soil poor, there is no falling-off in the teas, while the plucking average remains satisfactory. How is it then prices have gone down? Over-production is hinted at as the main cause; but our correspondent recognises the need of ample withering space; and his one trouble has been with delay in withering. That only a half-truth is expressed, in the legend that "good tea is made in the field," is very forcibly and clearly pointed out. "X. Rays" takes a different view on plucking, and holds that the race for big yields has studied quantity at the expense of quality; while on manuring he differs yet more from Hantane," holding it responsible to the extent of 1d a lb. in the fall, as inducing a fibrous leaf and one which yields less dry tea. Now these are points which science and experience combined should help to elucidate; for one would think that if the bush is used up and the leaf is destitute of sap, it is manure which should restore vigour to the bush and juice to the leaf—the "mucilage," which Mr. Crole says, gives thickness and cream which Tea tasters value so highly, to the liquor. "Yearly pruning, well cut down," is the prescription for maintaining both quality and quantity; and he combines belief in greater care in preparation than of old with the conviction that bad tea is made in the field, good tea in the Factory. His reason for this last proposition is rather unsatisfying; for he admits that with bad leaf good tea is impossible, while the best of leaf may be spoilt in the Factory. True; but when good tea is made out of "the best of leaf," why should not the field share the credit for it? Though the better jâts give higher yields, a mixture of jâts is desiderated for a better quality of made tea; but big yields, manuring and coarse plucking have increased exports at the cost of price.

"*Custos pauperis horti*" cannot plead poverty of ideas, nor can his "wattie" be a particularly poor place, if his flush runs ahead, and his coarser plucking be due to that cause. While absolving manuring of all blame, he is strongly of opinion that unscientific, savage pruning is responsible for the deterioration of tea. There can be no question that the pruning of coffee is not comparable for severity with tea pruning; while the manner of harvesting crop—divesting a bush of its tender leaves as they appear—must be injurious to its vigour and even its very life, were it not that tea is one of the hardiest of shrubs. To carry methods which are inevitably harsh and unnatural to their extremes, and over-pluck and over-prune, must, therefore, be suicidal; and our correspondent expresses his condemnation of these excesses in terms which will, we trust, leave a deep impression. He notes the same tendency, to overdoing in the Factory, where heavier rolling (oftener and more prolonged) heats the leaf, induces early fermentation, and affects quality. "Work must be good all round—in pruning, in plucking, in the Factory—to make tea." That is a truth worth remembering by those who think that the manager's absence from his charge at frequent intervals, cannot tell; and these processes are, of course, affected by short labour, which is held to account for the loss of 1d in the lb. "W. I. G." desires coarser plucking thinks manuring good land merely to increase the yield a mistake, notes less severity in pruning now, and greater care in manufacture—though lack of withering space is a hindrance, as also insufficient rolling power. These last, and short labour (leading to coarse and careless plucking, coupled with the absence of a wintering season) explain the deterioration. "Incog," from a medium elevation district, denies coarser plucking; and herein he differs from J. A. O. of Udapussellawa, who holds that manuring, by hastening flush, is responsible for coarse leaf, as also from G. H. G. from the Uva side, and T. from Matale West—all of whom admit coarse plucking and explain it by the larger profits it yields. Incog. finds that manuring one-third of the estate each year does not affect the quality of the yield as a whole; while the heavy pruning, which is occasionally necessary, does. The growing quantity turned out of the Factory renders close supervision difficult, if not impossible, and with a scanty labour supply which delays plucking, quality suffers. J. A. O. generally agrees with these views, and holds short labour and crowded Factories specially responsible for mischief. G. H. G.'s dictum that artificial manures destroy flavour will find smaller support than his suggestion that inquiry should be instituted as to what manures affect flavour, and how. It is probable that too forcing a manure makes the tea weak, while the other reflections on excessive pruning, the need of all round attention, short labour, and greedy plucking, merit attention. T's. demonstration of the greater remunerativeness of coarse plucking will be generally accepted, and the conclusion is obvious, that over-production must generally follow the methods which rather tell on quality. The fall is then only natural!

(*Letters Continued.*

No. XXI.

Madulkelle, Feb. 16.

DEAR SIR,—In reply to your circular of 12th inst., I beg to state that

1. Better leaf is now plucked in Ceylon than ever before, in fact as far as I can see, every year sees more careful plucking the rule.

2. Manuring, I am inclined to think, has certainly a slight prejudicial effect on quality, but not nearly so much as some people aver. The reason for poorer quality and prices will, I think, be found in

3. The severe pruning now more or less prevalent in the tea districts. The call for quantity from agents and owners as well as the endeavour to put our teas f. o. b. for the lowest figure possible, and which can only be achieved by securing quantity, is forcing Superintendents much against their will sometimes, to prune oftener and severer than they otherwise might.

4. Good tea is made in the field. Your parenthetical remark goes without saying.

5. Not as yet has shortness of labour done any harm. For a month or so I may be forced to pluck a little coarser, but that should only affect the prices of a break or so.

6. I would place the reasons for reduced prices in order of merit so:—

3. Manuring—possibly.
2. Heavy and frequent pruning—probably.
1. Over-production—undoubtedly.

NORTH OF KANDY.

No. XXII.

1. "Coarser plucking' has nothing to do with it. It is the endeavour of every Superintendent, who takes an interest in his work, to harvest fair leaf all the year round; but the style of plucking is ruled by the weather and state of

the labour market. In heavy flushing weather it takes twelve or more days to get round—in slack times the round is completed in 7 or 8 days when very fine leaf is the result. In fact plucking is generally carried on now as it has been conducted any time during the last ten years.

2. In my opinion manured tea lacks strength as well as flavour.

3. Can have no possible effect on general prices. Pruning is being carried on in twenty different ways every month in the year on one-twentieth of the total average of tea.

4. No.

5. Shortness of labour supply has never affected work in any Factory as far as I know. It can never fit in perfectly with flush demand.

6. I can think of no other possible cause but over-production. N. A.

No. XXIII.

Prices have fallen but it does not follow that quality has deteriorated. In fact one of the annual Brokers' Circulars recently issued states that quality has, if anything improved. If in particular instances quality has not been maintained it is probably due to (a) Coarser Plucking with the object of an increased yield; (b) irregular plucking from want of labour; (c) machinery and withering space not being kept up to requirements. Our knowledge of tea making is empirical; but is always increasing and Planters are always ready to spread the latest tip. Though Superintendents may not spend as much time in the factory as formerly, they have well-trained tea-makers who are competent under supervision to attend to the details of manufacture. O. Y. A.

No. XXIV.

I do not think the cause lies in the tea itself; but in the increased supply, say overproduction.

The leaf plucked is no coarser than it was.

Manuring has not become so general as to be responsible for it, nor severe Pruning.

If anything, the manufacture receives more attention than it ever did, though this cannot overcome bad plucking.

Shortness of labour is felt more in field-work than crop, though it leads to some coarser leaf. The market holds the real reason. W.

No. XXV.

The Country Generally, Feb. 16.

1. From what I have seen the plucking is *finer* in all districts than a few years ago.

In reply to your queries from Nos. 2 to 6 the soil alone is to blame for the loss of the Ceylon flavour which brought the teas from this island into favour. Few planters will agree with me, perhaps, but the above is my conviction, the bushes get no tropical winter such as they have in India and there is no recuperation—no rest! I fear *manure* will not bring back the flavour. "H."

No. XXVI.

Passara, Feb. 16.

1. So far as I am concerned, I pluck the same now as I did 3 years ago.

2. Very little tea is yet manured in Uva, but I should think manuring extensively would affect the quality of the tea detrimentally: the flushes would be heavier, come on more quickly and consequently the leaves and shoots would be more sappy and succulent.

3. The same applies to severe pruning.

4. Here I think we touch the spot. I am convinced were we to follow more closely India in this respect and have more continuous European supervision in our factories, our prices would improve. Far too much is left to native supervision. There is little doubt that the best and most carefully plucked leaf is often spoiled in the manufacture, or at least not done justice to.

5. This has not much to do with our poor prices I consider. P.

No. XXVII.

The Country Generally, Feb. 16.

Causes which have brought down the average prices for Ceylon teas:—

1. What is called 'coarser plucking' which is really sensible plucking. Had it been possible to send 100 millions lb. of the same tea as once was supplied by Rookwood, Hooloo and Agar's Land, prices would have fallen to the same level. Fine plucking produces only a fancy article insipid and unsuited to the taste of the million.

2. Manuring has only to do with quantity not quality.

3. Neither does severe pruning affect the quality—only shortens the life of the bush.

4. Oh, yes. Preparation has much to do with it and the quantity of red leaf and muck sent to Colombo sales is a scandal. I quite endorse, by the way, all that Mr. Green writes *re* "small breaks." Those brokers are enough to break the records of small proprietors.

5. Shortness of labour may affect the quantity; but no judicious Superintendent would allow it to affect the quality. Ergo in that case, prices ought to go up.

6. Production—I do not say over-production yet. S.

No. XXVIII.

Pussellawa.

(1) Coarse plucking is a curse causing over-production &c. and undoubtedly spoiling our market.

(2) I don't think manuring has been general enough or carried on long enough, as a rule, to much affect bulk of Ceylon teas as yet, although my impression is that it gives quantity at expense of quality.

(3) We always found in old days that a severe pruning spoilt our teas for the season. I fancy nearly as many men prune light now-a-days as heavy, *i.e.* go to the other extreme and merely slash across.

(4) With present large quantities turned out of factories I fear the preparation is not so careful, and more is done by rule of thumb than before. (Good tea is made by attention to detail in *every* process connected with manufacture.)

(5) Shortness of labour should not affect the manufacture much. It pays better to abandon a field for months than to struggle round the plucking in 15 days or so and get bad leaf.

(6) Not particularly.

I.

XXIX.

Maskeliya, Feb. 13.

1. I do not think planters as a rule are plucking coarser than before.

2. Manuring certainly affects the tea to a certain extent, but when bad jât is manured, the leaf improves in softness and by getting a better leaf to manipulate in the factory, I think a great deal of, or all, the evil effects of manure, are done away with.

3. The severe pruning done on a lot of estates is no doubt accounting for lower prices.

4. 75 per cent of Ceylon factories have insufficient withering space: as this is the most important item in manufacture greater attention should be paid to it. The tea is certainly made in the field to a large extent. An estate with bad climate, jât and soil can never compete, however fine the plucking, with an upcountry estate.

5. Shortness of labour no doubt greatly affects prices, as planters cannot keep up with their flushes. My conviction is that should labour be short, planters should let part of the estate run and only pluck the fields they can go round within 8-12 days, according to the climate.

7. Overproduction and increased supply are however the main causes.—Yours faithfully,

PLANTER.

XXX.

Dikoya, Feb. 17.

1. There can be but little doubt of late years most estates have studied the question of yield per acre, and instead of vieing with each other with regard to prices, it has been more a question whether A gets a better yield per acre than B, and I consider that this has simply solved itself into coarser leaf having been accepted as a result.

2. The only way manuring might have affected prices is in the case of an insufficient labour force to cope with the extra leaf; but given an adequate labor force with careful manuring; and prices, in my opinion, would be improved.

3. The question of drastic pruning should not affect the point in question at all materially, as it is a work that *has* to be done sooner or later, and most estates would probably arrange to do only a small proportion of their acreage in the year, and in that way prices for the year would not be materially affected.

4 This question of probable carelessness in Factory affecting prices should in a general sense, I think, be put aside, as a manager who neglected the supervision of his Factory would probably neglect the work outside as well, and in that case would not remain long where he was. I do think, however, there is a good deal of follow-my-leader business about tea manufacture in general which might be remedied; but the secret of bad prices in 9 cases out of 10 is *insufficient withering accommodation.* How many Factories are really properly equipped in this respect? Estates have yearly increased their crops and yet have the same accommodation as they had when they were getting probably 25-30 per cent less.

5. In many cases shortness of labor has meant bad leaf and bad prices, but this state of things would probably not last very long and so on most estates should not account for the general fall.

6. The whole thing will work itself out in my opinion; men *must* pluck finer to improve prices; those that do will get attention in the market, and those who continue for yield only will probably get lower and lower til they realise that it is not paying them.

It has paid of late years quantity as against quality: but the time has come when quality must have its innings and the sooner it is realised the better for the name of Ceylon tea.

E. H. R.

No. XXXI.

17th Feb.

SIR,—In reply to yours of 12th, I do not think planters are going in for coarser plucking now on this side of the country than they were a year or two ago. Little manuring has been done so far.

Severe pruning undoubtedly affects the quality of the tea made, at least for some months after pruning.

I am certain much better teas could be made in some factories, were more attention paid to the work in both field and factory. I believe in careful, *not fine*, plucking and adequate supervision in the factory. Given the above almost any estate in Uva over 3,000 ft. elevation should show averages at least 1d per lb. above the London prices for the year, and in the dry weather June-Sept., there should be a much greater difference. Many men scarcely look at the leaf in the baskets, and certainly do not over-burden the factory with their presence, and when their teas fetch lower prices than their neighbours', lay the blame everywhere but in the right quarter.

During the busy months, March, April and May, few men have sufficient labor to get round in 8 to 10 days and the teas made from a flush 12-16 days old are bound to be inferior. Increased supply is, however, in my opinion, the main cause of the lower prices ruling of late years.—Yours,

J.

XXXII.

1. I do not consider that coarser plucking is responsible for the falling-off in quality.

2. Nor do I think it's attributable to manuring.

3. Not low and frequent pruning—to secure quality—is the chief factor in the depreciated quality.

4. Careless work in the factory and inadequate machinery will depreciate the value of tea; but tea is made in the field and not only is careful plucking necessary, but, to secure flavour, the trees must be pruned high and pruned at long intervals. N.B.—The fine teas from St. Leonards were procured in this way. When working the Kandapola group of estates and making some 50,000 lb. of tea a month, I secured some of my best prices and teas, from leaf that, because of inadequate accommodation, had been only a quarter withered

5 Short labour spoils the quality of leaf as the plucking is not performed in its proper rotation and the result is* a large amount of "bhanji" leaf is formed (and cannot easily be got rid of for months after) which will ruin the quality in any tea.

D.

No. XXXIII.

Dimbula, Feb. 17.

1. I have no doubt that coarser plucking of leaf has very much to do with it, as well as trying to get a much greater yield per acre. V.A. says this field must (observe the word) give 450 or 500 lb. per acre.

2. No! manuring tea has not done it. The more healthy the bushes, the better leaf.

3. I am against severe pruning; medium is what I do, cutting down once in 6 years or so. Less severe pruning is done now than formerly.

4. No, more attention. Good tea is neither made in the field nor in the factory: it's the combination of both. It's more easily spoiled in the factory than in the field. It must be remembered that if flavour and strength are not in the leaf no manufacturing can put it there, though it can be very easily thrown away in the factory.

* This is, of course, *besides* the immediate result of coarse leaf harvested.

Careful factory work is a great essential in making tea.

5. Shortness of labour has made your tea run away; consequently, coarser tea is plucked, as no person likes to throw away leaf.

6. I know no other cause except over-production. J. J.

No. XXXIV.

Teldeniya, Feb. 18.

1. I fancy plucking is very much what it always was, and has nothing to do with the fall in prices.

2. Can (judicious ! ?) manuring do harm to any cultivation or crop? I do not think so. If new soil or manuring upsets quality and flavour, let us rush for old exhausted land.

3. There is no doubt severe pruning (cutting down to a foot) does away with quality and flavour of tea for fully 12 months.

4. I do not think less attention is given to factory work. On the other hand, too much fuss and interference with the tea-maker is apt to upset the regular routine of work. Of course, "tea is made in the field"—good or bad—but it takes some trying to spoil fine leaf.

5. Glad to say, I have never been short-handed, but I can quite believe a short labour supply would upset the plucking a good deal and so spoil the quality of the leaf.

6-7. It is not possible to make the same tea all through the year, weather and pruning having a great effect on quality and make, and prices are therefore bound to rise and fall. The tea of today is as good as ever it was. Increased supply should bear the blame of fall in the market value—here we make our best teas in the south-west months, I suppose from the check the bushes receive from the wind—our poorest teas in March and April, when the great rush of leaf is on.

I add our 3 wants as a rule:—Want of withering space, want of power, and want of coolies.

What say you? Do you think Naseby teas of today are not as good as those when fine prices were being realized some time back? What puzzles one is, where all the poor teas sold in the Colombo market comes from, or how it is plucked and made—but it was always so, it is no new thing. R. B.

No. XXXV.

February 18.

1. I do not think men, as a rule, pluck coarser than formerly.

2. Manuring may, at first application, give you a leaf lighter than the trees yielded before they were manured, but as manuring, in the course of three or four months, improves *the wood*, the leaf must naturally be better from manured trees.

3. Severe pruning is only resorted to when the trees, say after three prunings are, what is called, pruned down.

4. Tea manufacture, as a rule, is as much attended to as formerly.

5. If an estate is short of labour, naturally too long time elapses between each plucking, and liquor suffers.

6. I think production is getting ahead, gradually, of consumption—hence the gradual fall in price. V. A.

No. XXXVI.

February 18, 1897.

(1). Considering that a large number of estates had been formed into Companies it is a difficult matter to say whether coarse plucking is the principle cause for low prices. I think Superintendents pay more attention to plucking than they did a few years ago. Pro. planters who work their own estates, are generally fond of coarse plucking, doing great harm to their own interests in bringing down the average prices for Ceylon teas.

(2). Having had little or no experience in manuring tea, I am not in a position to answer this question.

(3). Severe pruning is bound to bring down the average prices for Ceylon teas, unless estates adopt a proper system of pruning ⅓rd of estate every year. A great number of lowcountry places are pruned once in 12 or 18 months, and these (estates) cannot possibly send good teas to the market. Estates at high elevation are pruned once in three years, but the time is not far distant when we shall have to follow the example of lowcountry planters of pruning tea once in 18 months.

(4). I do not think careful attention is paid to the manufacturing of tea. Native tea-makers are often very careless, and Superintendents should pay three or four visits to the factory every day.

(5). I have never been short of labour, but those who have not a sufficient labour force on the estate to pluck once in 12 days, cannot expect to make good tea.

(6). Careful *plucking*, *manufacture*, and proper system of *pruning*, may keep up Ceylon prices, but as far as my experience goes, as the tea gets older, Ceylon is bound to produce a poorer quality of teas.

(7). Over-production has a great deal to do with the low prices, but this sort of thing cannot go on for any length of time, for the day will come, when estates at low elevations will gradually become worthless, giving a chance to estates at high elevation to realize good prices. W. N.

THE PLUCKING, PRUNING AND PREPARATION OF TEA: REVIEW OF LETTERS XXI TO XXXVI.

Resuming our remarks on the letters on the above subject, from No. 21, we note a continuance of the divergence of opinion already recorded on the subject of coarse plucking. It is rather a difference of testimony on a matter of fact; for, if there is coarser or finer plucking now than before, the statement regarding the change would scarcely be reckoned an opinion, about which practical men of experience would differ. Either there is coaser plucking now, or there is not. How is it, then that some writers distinctly affirm coarser plucking, and either justify it as more remunerative, or condemn it as leading to the fall in prices which is loudly deplored, while other writers as confidently report an improvement in plucking, but equally lament the lower prices, which they refer to other causes than the system of plucking? The explanation seems to us simple, and one which reflects on the accuracy neither of observation nor of statement of the writers. Each refers to matters within his personal knowledge and observation without the least idea of misleading. The system of plucking differs in different districts, and even on different estates. Roughly speaking, estates in the lowcountry, or of medium elevation, prefer quantity to quality, seeing that their teas cannot command the prices which those of the higher districts fetch;

while proprietors, who own plantations in districts of highest elevation, are naturally ambitious of maintaining the prices which have given their places prominence Of course, there may be exceptions in lowcountry estates plucking fine, and high estates going in for quantity ; but, as a rule, a hot steamy climate favours quantity, and the rarer air of the highlands imparts a delicate flavour to tea. We are unable to illustrate this explanation by reference to particular letters, as some of our correspondents, no doubt for good cause, prefer not to mention the district from which they write, or to indicate the estate or estates whose system they record ; but, we think, it will be found that the apparent discrepancy in the evidence of the witnesses, who have favoured us with replies, is explicable by the different standpoints from which they write. The same explanation applies, though not to the same extent, to the varying answers to some of the other questions.

But to proceed, "North of Kandy" from Madulkelle reports, not only better plucking than ever before, but an improvement in plucking every year. "O. Y. A." on the other hand, in our issue of the 11th, admits that, if quality has not been maintained in particular instances, it is probably due to coarser plucking, whose object is a higher yield, or irregular plucking through lack of labour ; while "N. A." thinks that coarser plucking has nothing to do with the fall in prices. He avers that it is the endeavour of every superintendent who takes an interest in his work to harvest fair leaf all the year round, but the style of plucking is affected by the weather and the labour supply, though generally the system has remained the same for the past ten years. "W." agrees that the leaf plucked is no coarser than it used to be, though he is silent on the different results which must follow from making the round of an estate in 7 or 8 days, and from inability to get through the fields before 10 to 12 days, if not more. Of these four correspondents, two hold manuring, and severe pruning to maintain yield, responsible for deterioration ; while a third is silent on these operations, and the fourth denies that they are general enough to supply the explanation. Over-production is the cause which strikes all ; and while one dismisses the suggestion of the need of greater care in the factory with the dictum that good tea is made in the field, another denies it laconically, a third holds a trained teamaker an ample equivalent for less time in the factory by the superintendent, and the fourth reports that manufacture receives more attention than ever before !

Two of the four letters in our issue of the 13th instant are dated from "The Country Generally" ! They should be useful as illustrating how opinions differ throughout the country generally, and establishing that there are two faces in a shield. "H" declares that plucking is finer in all the districts he has seen, than it was a few years ago ; but "S" is convinced that what is called coarser plucking is really sensible plucking, and that, if 100 million lb. of the same tea had been exported as once distinguished Rookwood, Hooloo and Agar's Land, the fall in price would have been the same as now. Fine plucking, in his view, produces only a fancy article, insipid and unsuited to the taste of the million. Here, it seems clear to us, is a radical difference of opinion on paper, as to what constitutes fine plucking ; and we should not be surprised if, in practice, "H" and "S" agree as to what constitutes fair and sensible plucking. "P." from Passara plucks the same as he did three years ago ; neither manuring nor heavy pruning is practised extensively in Uva, so that they cannot be held responsible for deterioration, if such is the effect of these two operations ; but what does tell on prices, he considers, is the absence of sufficiently close supervision in the factory. In India, he says, the practice is different ; but too much is left here to the native subordinate, whose intelligence and knowledge are less than his master's, and who would naturally follow his master in taking things easy in the factory. "I." from Pussellawa differs from the three correspondents, who have preceded him, in regarding coarse plucking, not only as a fact, but as a curse too in its effect on the market. Here, then, are four planters, each of whom takes a different view of plucking—one insists that it is finer, wherever he has been, than it was a few years ago ; the second, that he himself plucks the same as he did three years ago, and he evidently knows no change in others ; the third lauds what people call coarse plucking as sensible plucking ; while the fourth spells coarse plucking curse ! Then as to the causes of the fall in prices, we have seen that "P" holds the lack of supervision in the factory responsible. "H." thinks the secret is in the soil which, without the recuperation of wintering, is helpless to produce the same leaf it did when the bushes were young, while manure cannot bring back the flavour ; "S." exonerates manures, which affect only quantity, and severe pruning which tells only on the life of the bush, but blames preparation, and the quantity of red leaf and muck sent into the Colombo market ; "I" too, fears that the increased quantities put out of the factories now-a-days, render care difficult, if not impossible, in the factory, though he holds both manuring and hard pruning prejudicial to quality. With regard to red leaf and muck, it is really a question for the producer whether they leave any profit at all, and, even if they do, whether they would not be more profitable directly as manure, and indirectly by reducing the quantity of low grade teas thrown on the market

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THE KOLA NUT.—Most of our readers are familiar with the name of this product, and we have done our best to arouse a practical interest in its cultivation by distribution of seed and deligently publishing all the information we could collect concerning it. Briefly, it will grow anywhere where Liberian coffee will grow, but the hotter and moister the climate the better. The trees planted from are ten to twenty feet apart. The returns compare favourably with even the best of coffee land. The chief difficulty hitherto experienced in India was the enormous price demanded for the seed by the few firms from whom it was obtainable. We are glad to announce that the great colonial seedsman, Mr. Thos. Christy, states in reply to a query, that he can deliver a basket of about 100 lb. f.o.b. London for about £6. As perhaps ten nuts go to the pound, this counting freight, makes the cost per hundred about R12-8-0 on the estate. Allowing 400 trees per acre, and the liberal margin of twenty-five per cent for failures in germination, the initial cost in seed runs to about sixty rupees per acre. If half a dozen men clubbed together, it would probably come a greater deal cheaper. We have an idea that the kola plants might be first put out tentatively as a species of shade tree among the coffee itself, say at the rate of 100 trees per acre.—*Planting Opinion*, March 6.

KANDYAN HILLS COMPANY, LD.

A general meeting of shareholders of the Kandyan Hills Company, Ltd., was held at the offices of Messrs. Carson & Co., 21, Baillie Street, on the 19th March.

The report was as follows :—

ACREAGE :

Originally purchased ..	..	1.190 acres.
Since acquired ..	..	100 ,,
		1.290 ,,
Tea in bearing ..	..	320 ,,
New clearing 26 planted	..	32 ,,
In process of clearing	..	50 ,,
		402 ,,
Reserve land ..	..	790 ,,
Cocoa	..	100 ,,
		1,292 ,,

The Directors have pleasure in submitting the accounts for the past year ending 31st Dec., 1896.

The crop secured amounted to 128,625 lb. made tea realised R49,251·74 and 103 cwt. 1 qr. 24 lb. cocoa realizing R3,508·12. The average cost (exclusive of expenditure of items under capital account, profit and loss and sundries) of made tea was 28·27 cents per lb., and the average price realized 38·27 cents per lb. This includes R3,126·76 spent on manuring 110 acres.

The average cost per cwt. of cocoa was R28·27. The average price realised R33·90 per cwt.

The balance at debit of profit and loss account after making provision for

	R.	c.
Stationery and postages ..	50	00
Preliminary expenses in the formation of the Company, including commission to Mr. Grigson ..	5,241	65
Interest at 7 per cent on £4,500 mortgage	5,976	92
Directors' fees Visiting Agent ..	1,300	00
Agents and Secretaries.. ..	750	00
Auditor's fees	50	00
	R13,368	57

amounts to R566·71, which the Directors propose to carry forward to next account.

The result is disappointing, and is accounted for by low prices ruling for medium teas last year, and the low prices of cocoa.

The Company was also unfortunate in losing the services of Mr. E. S. Grigson, and subsequently Mr. G. F. Traill, who was acting as visiting agent during the former's absence at home.

Every effort is being made to improve the quality and the manufacture of the teas.

Only 26 acres having been planted last year, it is proposed that up to 74 acres be opened this year, making the 100 acres as contemplated in the prospectus.

The mortgage for £4,500 bearing interest at 7 per cent per annum, is being replaced by one for a similar amount, bearing interest at the rate of 5 per cent per annum.

The appointment of an auditor will rest with the meeting.—By order of the directors,

CARSON & Co., *Agents and Secretaries.*

THE ROEBERRY TEA COMPANY OF CEYLON, LIMITED.

The first annual ordinary general meeting of the shareholders of this Company was held at the offices of Messrs. Bois Brothers & Co. on the 22nd March.

The Report was as follows :—

ACREAGE.

407 acres 4 years old and upward.
135 ,, 3 do do
127½ ,, Just planted

669½ acres of Tea
4½ ,, Cardamoms just planted
23 ,, Grevilleas

696¾ acres
336½ ,, Uncultivated

Total. 1,033 acres

The Directors have now the pleasure to submit heir first annual report and accounts being those for the year ending 31st December last. The yield of Tea during the period has been 127,840 lb. costing cts. 38·52 per lb. and realizing cts. 45·47 per lb.

On a reference to the accounts it will be seen that the nett profit amounts to R6,753·69, after writing off the whole of the preliminary expenses, and the Directors recommend that this balance should be carried forward to the next account.

The result of the year's working is not so satisfactory as the Directors at one time hoped, and this to a great extent has been caused by the delay in the completion of the Factory which necessitated the tea being manufactured for a considerable period at the nearest available Factory, involving a heavy expenditure for transport of green leaf for a distance of some 14 miles, besides the additional cost of manufacture.

The Factory is now in satisfactory working order, and it is hoped that the consequent improvement in the quality of the tea made there since its completion in September will be maintained.

During the year 127 acres of tea have been planted and large nurseries established, which will be found adequate for any further extensions that may be decided upon in the immediate future.

Mr. Mason visited the estates on the 12th and 13th February and reports that the general appearance and condition of the property is "distinctly good; the Roeberry division in particular shews a very thick cover almost throughout the entire estate."

The out-turn of crop for last year was as follows :—

	Bushels Coffee.	lbs. Tea.
	284	127,840
as against an estimate of ..	280	115,500

The estimate for the current year is 174,000 lb of Tea against an expenditure of R57,790, which sum, however, includes the cost of up-keep of all young tea

Mr. Mason reports that the planting of the new Clearing was all finished in January and that the work has been most carefully done, the vacancies at present appearing being almost nil.

The old tea, viz., 190 acres, 5 years of age and upwards, gave an average return of 466 lb. per acre, and there is no reason to suppose that the younger tea will not give equally satisfactory results when it arrives at maturity.

In terms of the Articles of Association all the Directors now retire but are eligible for re-election. The appointment of an Auditor for the current year wil rest with the meeting.

THE PALMERSTON TEA COMPANY OF CEYLON, LIMITED.

At a meeting of the Shareholders of the Palmerston Tea Company of Ceylon, Limited, held at the registered office, No. 11, Queen's Street, Colombo, on the 22nd March.

The report is as follows :—

ACREAGE.

403 acres over 5 years
69 ,, ,, 3 ,,

472
21 ,, Forest, Grass and Timber Trees

Total..493 Acres,

The Directors have now the pleasure to submit their first annual report and accounts, being those for the year ending 31st December last. The yield of Tea during the period has been 176,410 lb. costing 29·66 cts. and realizing 55·85 cts. per lb.

As will we seen from the accounts the nett profits for the year amount to R33,348·58, after writing off one-third of the perliminary expenses. An interim dividend of 4 per cent wasdeclared on the 14th August, absorbing R16,400·00, and the Directors recommend a final dividend of 4 per cent making 8 per cent for the year. The sum of R548·58 will then be left to be carried forward to the current year's account.

The Estimate for 1897 is 190,000 lb. Tea against an expenditure on working account of R55,605·50.

In terms of the Articles of Association all the Directors now retire but are eligible for re-election.

The appointment of an Auditor for the current year will rest with the meeting.

THE HIGH FORESTS ESTATES COMPANY LIMITED.

The annual ordinary general meeting of the above Company was held at the Company's Offices, No. 7, Queen Street, Fort, Colombo, at 3 p.m. on Monday, 22nd March.

The Report is as follows:

ACREAGE.

Tea in bearing ..	432 acres.	
,, in partial bearing	103 ,,	
,, not in bearing ..	53 ,,	
,, planted in 1896 ..	246 ,,	
		834 acres.
Forest and Patna ..		798 ,,
Total ..		1,632

The Directors have pleasure in submitting to the Shareholders the Account of the Company for the past year.

The total crops secured were 146,861 lb. tea, which realized a net average of 53 cents per lb. and 5,513 lb. Cinchona bark at a cost of R48,287·47 on working account.

After making ample provision for depreciation of Buildings and Machinery the result of the year's working shows a profit of R25,942·90, from which falls to be deducted the balance at debit (R3,608·54) brought forward from 1895. This leaves a sum of R22,334·36 available, and the Directors now recommend the payment of a dividend of 2½ per cent, which will absorb R20,000 and leave a balance of R2 334.36 to be carried forward to the current year's accounts.

For the information of Shareholders a copy of Mr. Megginson's report on the Estate, dated 6th March, 1897, is issued with this report. The reasons for the shortfall in the crop are fully given therein. The Directors have every confidence that the current year's working will show more satisfactory results.

During 1896 a sum of R43,886·50 was expended on the opening of the 246 acres and on nurseries, R26,139·17 on buildings, and R19,563·67 on machinery. The expenditure on Capital Account during 1897 is estimated at R58,977, viz: R14,750 on completing the extension of the Factory, Bungalow, Lines, etc., R4,250 on new machinery, and R39,977 on the upkeep of the young tea and in opening up a further 215 acres. To meet this Capital expenditure the Directors in September last gave notice of a call, payable on 1st Jan., 1897, of R150 per share on the part-paid shares, which call has been fully met.

The yield of tea in 1897 is estimated at 200,000 lb. against an expenditure of R64,090.

During the past year Mr. G. W. Carlyon resigned his seat on the Board and Mr. C. A. Leechman was appointed to the vacancy. Subsequently Mr. C. A. Leechman resigned and Mr. F. W. Bois, on the invitation of the other Directors, accepted the vacant seat.

Under the articles of Association all the Directors now retire from office but are eligible for reelection.

The appointment of an Auditor for the current year will rest with the meeting.

By order of the Directors, Whittall & Co., Agents and Secretaries.

Colombo, 11th March, 1897.

COLOMBO COMMERCIAL COMPANY, LIMITED.

The following is a copy of the Directors' report, which was presented at the second ordinary general meeting held in London on the 16th inst.

The Directors now present the following annual accounts to shareholders, viz.:—

Profit and loss account for the year ending 30th September, 1896.

Balance sheet made up to 30th September, 1896.

The year's operations have resulted satisfactorily, and the Directors are able to recommend the payment of the following dividends free of Income Tax:—

	£
Dividend in full on the 6 per cent. Preference shares for the year ending 30th September, 1896 ..	1,091 2 0
Dividend of 8 per cent. on the Ordi- shares for the same period ..	5,600 0 0
	6,691 2 0

After payment of these Dividends there will remain the sum of £415 15s. 3d. to be carried forward to next account.

During the year the six per cent. Debentures have been converted into debentures bearing four and a half per cent. interest, and an additional sum of £4,000 has been issued at this rate. It is the present intention of the Board to pay off £4,000 of five per cent. debentures, maturing on 30th September, 1897.

The Liquid Assets in Ceylon appears in the Company's accounts at an exchange of 1s. 1d. per rupee the present value of the rupee being about 1s, 3d.

It will be seen by the profit and loss account that the sum of £2,007 8s. 4d. has been transferred to exchange reserve against capital expenditure. The board are glad to report that they have been enabled to make such a substantial addition to this account during the year; inclusive of this sum the amount appearing under this heading is now £19,000.

Braybrooke Lodge, a property adjoining the Company's mills at Colombo, was in the market, and in view of the extension of the Company's business the Directors considered it advisable to secure it. The purchase has been completed, and the cost has been written off in the accounts now presented.

Mr. Brown went to Ceylon last November, and is expected to return in time to take the Chair at the forthcoming meeting.

The Directors are glad to report that the prospects of the Company are favourable, and they also have much pleasure in acknowledging the valuable services rendered by the Company's Manager and staff in Ceyton during the past twelve months.

On the retirement of Mr. H. H. Potts from the Board through ill health, the Directors elected Mr. P. C. Oswald to the vacancy. Under clause No. 95 of the Articles of Association, Mr. Oswald retires from the Board on this occasion, and, being eligible, offers himself for re-election.

Messrs. Deloitte, Dever, Griffiths & Co., the Auditors, also offer themselves for re-election.

By order, J. ALEC ROBERTS,
Secretary

London, March 5th, 1897.

COLLOM'S PATENT "ACME" TEA SORTING MACHINE AND SELF-ACTING MESH CLEANER.

Last week we were invited to attend the offices of Mr. James Melling, consulting engineer, Dashwood House, E.C., to witness a demonstration of a working model of the above-mentioned machine. Mr. Collom, the inventor and patentee, was present and explained the working and the advantages he claims for his invention. It is a neat, compact machine about 10 ft. in length, 2 ft. 6 in. wide, and 1 ft. 6 in. high. The longtudinal frames are of strong angle iron, strengthened at the corners by cheek plates being rivetted to the frames, and are held rigidly together by traverse steel rods.

Upon this structure two long trays are suspended, in which the interchangeable sliding mesh frames are placed. The upper tray has a slight fall from right to left, the under tray from left to right. This fall can be increased or lessened according to wish. An ingenious and simple arrangement is fitted to the two trays, and is connected to a crank shaft having its supports and bearings at the left hand end of the framework. The crank shaft is also fitted with a small fly-wheel and a split pulley. When the motive-power is applied the crank shaft and connecting rod impart to the trays a rapid backward and forward motion, so arranged that a counter-balancing action is obtained, thus ensuring absolute steadiness. A ½-h.p. engine is sufficient to drive a full size machine.

Mr. Collom has recently added a "mesh cleaner," a very useful addition. When the meshes become choked, by simply pressing a lever downwards the "mesh cleaner" is put into action, and the whole sifting surfaces become at once quite free. This is accomplished while the machine is running at full speed, a great saving of time. This invention, it is claimed, will sort five, three, or two grades at one operation, and we were informed that a full-size machine has sorted 1,000 lb. of tea in one hour.

The model certainly worked admirably. A pound and a half to two pounds of tea was placed in the top tray (when in motion), and in a very short time all had passed through the different sorting spouts into separate receptacles, completing the operation in a most satisfactory manner.—*H. and C. Mail*, March 5.

THE INDIAN TEA ASSOCIATION, LONDON.

The following is the interim report of the American and Foreign Tea Committee :—

In presenting their interim report the committee have the pleasure to state that, in response to the appeal made in March, 1896, subscription to the fund for introducing Indian teas to the American market amounted to the sum of R103,674-8-0 say (£6,500) as against R92,575 collected in 1895. This included, as in the previous year, a generous contribution from the planters of Southern India.

Mr. Blechynden, the representative of the association in America, has, under the direction and supervision of your committee, continued to co-operate with Mr. Mackenzie, representing Ceylon, in the work of bringing the teas of both India and Ceylon to the notice of the American public. Your committee are therefore satisfied that everything possible is being done to awaken interest in our teas by carefully arranged advertisements and articles in the press, as well as judicious aid given to traders in taking up our teas in competition with those of China and Japan.

Advertisements of Indian and Ceylon teas appear in large type, followed by the advertisements of traders who have the tea for sale, in leading journals circulating in the following towns, viz.: New York, Brooklyn, Philadelphia, Boston, Detroit, Buffalo, New Haven, New Bedford, Paterson, Pittsburg, Malome, Massina, and Chatiangay.

The committee beg to refer to the extracts from Mr. Blechynden's report on his work for 1896, which are annexed, as affording strong evidence of the value of the work done and of the necessity of continuing the campaign.

The progress made in the use of Indian and Ceylon teas in North America is distinctly encouraging, as the following figures, which have been carefully revised by Messrs. Gow, Wilson, and Stanton, will show: Indian and Ceylon tea taken by North America during each of the last six years. Indian: 1896, 5,205,405; 1895, 4,050.595; 1894, 2,423,230; 1893, 2,111,247; 1892, 1,586,426; 1891, 1,342,321lb. Ceylon: 1896, 4,268.614; 1895, 3.735,590; 1894, 2.295,140; 1893, 1,870,590; 1892, 1,489,474; 1891, 991,981lb. Total: 1896, 9,474,019; 1895, 7,792,185; 1894, 4,723,370: 1893, 3,981,837; 1892, 3,075,900; 1891, 2,334,302lb.

Foreign markets absorbed 42 million lbs of British-grown tea in 1896. There is no possibility of exactly gauging the benefit to prices thereby obtained, but some indication may be gathered from the following figures: The importations of all teas into the United Kingdom increased from 1890 to 1896 by 42 million lb., and the price of British-grown tea fell 2d per lb. in that period. It may be fairly assumed that if the 42 million lb. of tea absorbed by foreign markets had come to this market in 1896 prices would have been reduced by a further 2d per lb., which would mean a loss not less than a million pounds sterling to the Indirn tea producers only.

Looking at these facts, and considering that this year's crops from both India and Ceylon are likely to show a substantial increase, your committee are strongly of opinion that there should be no relaxation made at present in the effort to win the American market, and they therefore recommend another levy on the same basis as last year, to be collected, as before, in Calcutta.

Arthur Bryans, Robert Lyell, R. B. Magor, James Riddell, R. G. Shaw, A. G. Stanton, J. N. Stuart, John Stewart, W. H. Verner, C. W. Wallace, members of committee; Earnest Tye, secretary. Feb. 18, 1897.—*H. and C. Mail*, March 5.

PRODUCE AND PLANTING.

The Anti-Tea Crusade.—Mr. Crole's reference in his lecture read before the Society of Arts to the digestive difficulties of a meat tea has given the opponents of tea an opportunity. These good people occasionally lash themselves into frenzy about the awful consequences of tea drinking, and therefore the smallest indication of support from a lecturer on tea gives them a much-desired opening. Under the head of "The Terrors of the Teapot" the *Daily Graphic* prints the following effusion from a correspondent: "Tea is so daily—nay, hourly—a beverage that Mr. David Crole, whose lecture at the Society of Arts you recently reported, renders service to humanity by exposing its horrors and the risks people incur by imbibing freely of a poisonous effusion. The portentous names are perplexing, but who does not fear an attack of indigestion as pointed out by Mr. David Crole in his able lecture? He omits to speak of the meat breakfast. It is easier to digest than the meat tea, and might it not be helpful to analyse the assimilation of the contents of the terrible teapot in conjunction with, say, bacon, sausages, kidneys, cutlets, and other breakfast dishes, to say nothing of various cold meats on the side table? The demon teapot has so firm a hold that his worshippers will not easily lose faith in their idol. Practical suggestions of a less injurious beverage would benefit the community. Have we nothing to fall back on our breakfast but the small beer of the good old days when the horrible teapot and its deadliness were unknown?" It is rather rough on Mr. Crole that his lecture on tea should have been made a peg whereon to hang a hatful of abuse against tea, and an excuse for launching such demi-"cuss" words as "terrible," "horrible," and "demon" at an inoffensive teapot.

NEW JOINT STOCK ENTERPRISE DURING FEBRUARY.—The amount of new capital offered for public subscription during February amounted to £5,669,000. Of this amount £98,000 was asked for in connection with tea. During the first two months of this year the capital asked on behalf of new tea projects amounted to £203,000.

SAMPLING TEAS IN BOND.—In the course of a letter on this subject a correspondent writes: "Recently I received a parcel of tea, and the first three chests which were opened each contained from one pound to two pound samples worth 8d per lb. less than the original tea. This is the latest instance of many similar cases which have come under my own observation, and it is high time that this kind of thing was discontinued. There is something seriously wrong in a warehousing system of this kind."

GUATEMALA COFFEE.—Mr. Audley Gosling, Her Majesty's Minister at Guatemala, points out, with reference to the season's coffee crop, which he estimates will yield 600,000 quintals, value about £1,800,000 that Guatemala coffee continues to maintain its high price and reputation, nor has the fall in "Santos" (Brazilian) affected it. It is believed that even should over-production ensue, due to the extraordinary extension of the industry throughout Central America and Mexico, Guatemala coffee, owing to its excellent flavour and quality, will still find ready buyers. Where the cultivation of the berry is carefully conducted the trees suffer little deterioration. In Guatemala it is hand-picked, berry by berry, and not, as in Brazil, torn from the branches. The competition which Central and South American producers chiefly fear is that of the West Coast of Africa, where coffee-growing is fast superseding the palm-oil industry.

CINNAMON.—The demand for cinnamon is fully equal to the supply, and the tending of prices is in an upward direction. At the quarterly sales last week there was a brisk competition, and nearly the whole of 1,250 bales and 43 parcels Ceylon realised full rates current by private contract, to an advance of ½d per lb, especially for the commoner qualities. There was no material rise as compared with the prices established in November last. The general range of quotations was as follows: First quality cinnamon, low at 7½d to 9½d, ordinary to good at 10½d to 1s 1d, fine and superior garden growth at 1s 3d to 1s 6d; seconds, very inferior at 7d to 9d, common to finest at 10d to 1s 2d, choice plantation at 1s 4d to 1s 5d; thirds coarse at 8d to 9d, middling to fine 9½ to 1s 1d, best mark at 1s 3d to 1s 4d; fourths and fifths from 6½d up to 1s, extra fine 1s 1d, and a few broken (in boxes) at 9d to 10d per lb.

THE ADULTERATION OF PRODUCE.—A deputation representing the Produce Sectional Committee of the Manchester Chamber of Commerce recently waited upon Mr. T. W. Russell, Parlimentary Secretary to the Local Government Board, to urge the necessity for prompt legislation to amend the Adulteration of Food and Drugs Act in a number of points, the principal of which were the establishment of a Board of Reference for standards and a change of the law with respect to warranty. After hearing views of the deputation, Mr. Russell said his view was that without a properly constituted Board of Reference all legislation on this question must fail. It was very unjust to allow standards all purity to be fixed by analysts in different ways fo over the country, and it was absolutely necessary for the safety of the consumer as well as of the trader that such a Board should be set up to settle standards of purity that would be binding upon the whole community. A Bill based in the main on the recommendations of the Select Committee had been prepared, and the Departmens would lose no opportunity of pressing on the Cabinet the necessity for legislation. By the way, a Birmingham grocer who was fined the other day for selling coffee adulterated with 60 per cent. of chicory pleaded that he did not know he was doing wrong. Perhaps he thought his customers had a playful way of asking for coffee when they really wanted chicory.—*H. & C. Mail*, March 5.

VARIOUS PLANTING NOTES.

TOBACCO LEAF SALES.—We are obliged to Mr. Philip for supplying the information asked for by a correspondent in a recent issue. The result, in R25 per cwt. or about 23 cents a lb. cannot be considered very encouraging; but Mr. Philip had special difficulties to contend with and that he overcame these so well, says much for his tact and good management.

THE GLASGOW ESTATES CO.—A home shareholder writing to us by this mail, says:—"I have just seen the Glasgow Estates Report. I see nothing about the Small Reserve Fund, which was created some time ago; it seems to have been put to an account called the Extension Fund Account. At least if that is not the case, where is it? There is no mention of a Reserve Fund in the Director's Report, and they ought to have said that it had been merged in the Extension Fund." Our correspondent is in error in stating that a Reserve Fund was ever opened. The sums set aside from profits (over and above the usual provision for depreciation of buildings and machinery) have always been put to credit of the Extension Fund account, which was opened at the first annual general meeting of the Company.

PLANTING AND AGRICULTURE IN THE STRAITS SETTLEMENTS.—From the Report for 1896 of Mr. Berkeley, on Kuala Kangsar district:—

On the Kamuning and Waterloo estates the area under cultivation is greatly increased. On Heawood a big clearing has been planted up, and at Gapis the coffee, coconuts and pepper all look well. Syed Muse's pepper estate has become the property of Government by purchase, and Cicely has reverted to us on the expiration of the last lease. These two latter are still on our hands, but I hope tenants will soon be forthcoming. A large area of coffee has been planted on the Kinta road at Chegor Galah, Manura, Lerik, and elsewhere, and some of the older native pepper gardens look well.

Towards the end of the year there was great distress in many parts at Bota, Lambor, Kruh, Pulau Buaya, and elsewhere. This is accounted for—first, by the people not having been allowed *ladangs*—secondly, by their improvident habits, and thirdly—by the awful cattle plague which raged all through the district. They sell their rice in advance to traders for a very low price, often for clothes and jewellery. The Government came to their rescue, and rice was given to starving families, either free, in payment of work done, or on advance. It is to be hoped that they will take advantage of the lesson and cultivate more *bendang*, as they now know that no *ladangs* will be allowed. The best means the Government could adopt to prevent this recurring would be to stop the export of rice by a big export duty, and by charging heavy licenses to buy rice.

At the Bruas a good deal of land has been taken up, and much timber exported. It is to be hoped that the Timber Farm will no be renewed after 1897.

We suffered for six months from a severe drought, followed by one of the highest and certainly the longest lasting flood on record, which, by ruining a great deal of *padi*, added to the distress referred to above.

Correspondence.

To the Editor.

CEYLON TEA IN AMERICA.

London, 1st Feb. 1897.

Dear Sir,—In your leader (see page 545) on the interview "Brown Paterson" had with me, you say I am inconsistent in depreciating newspaper advertising, while praising the firm which advertises Ceylon tea in over 300 papers.

The difference lies in the fact that the latter is in Canada—a tea-drinking country; whereas "Brown Paterson" was referring to the United States—a coffee-drinking country. *There*, mere advertising, unless on a scale far beyond our means, would be quite useless, unless we first induced dealers to hold our teas. A strong friend of Ceylon tea writes "I am taking up a new town now, but will not advertise till I get 50 grocers to hold my teas." I send a cutting from the *American Grocer* showing the imports of tea into the United States from 1880 to 1896 [already given in *Observer*.—Ed. *C.O.*] You will see that the consumption *per head* has decreased, although the average cost per lb. has fallen from 27 cts. (1s 1½d) to 13½ cts (6¾d). This, of course, arises from the great immigration from coffee drinking countries, chiefly Italy, Austria and Germany about which, see enclosed cutting from *Globe*. I enclose another reference to the Japan tea organizer with Mr. Larkin's reply to what he says on behalf of Japan tea.—Yours faithfully,

WM. MACKENZIE.

PLANTING AND THE AUSTRALIAN NEW HEBRIDES COMPANY, LTD.

10 Bridge Street, Sydney, Feb. 5.

To the Editor, Tropical Agriculturist, Colombo.

Sir,—We give you some particulars hereunder regarding the New Hebrides which we think will be of interest to many of your readers.

The New Hebrides are situated 1,460 miles North-East of Sydney, and consist of some 20 fertile Islands, some of which are 60 miles in length. They are connected with Australia by a three-weekly steam service from Sydney (a time-table of which we enclose herewith) by a steamer of 1,200 tons @ 12 knots speed. The Capital of the New Hebrides Islands is Port Villa situated on the Island of Sandwich. The Sydney steamer here connects with the Inter-Island steamer of 400 tons register.

Our idea in bringing the New Hebrides under your notice is on account of the many advantages it affords for the "Tropical Agriculturist." Coffee, Cocoa, Vanilla, and Bananas are cultivated.

Coffee was introduced some five or six years ago and although cultivated in a primitive way the export last year amounted to some 250 to 300 tons. The bulk is sold in Sydney realizing from 7d to 10d per lb. Both the climate and soil are well suited to its cultivation. The Islands are hilly and covered with vegetation and abundance of shade for young coffee may be left when clearing the land for Plantation purposes.

Bananas are now grown in large quantities, the steamer on her last trip bringing 15,000 bunches the fruit is far superior than that of Queensland and Fiji.

Cacao and Vanilla.—It is only during the last twelve months that these have been introduced, and the young plants are looking remarkably well.

There is but little doubt that the New Hebrides afford fine fields for the Coffee and Tea Planter, large tracts of choicest land may be purchased or rented at nominal cost. Labor may be had in abundance from the local labor recruiting vessels who bring the labour from Islands other than the one upon the Planter who requires the boys is settled. The recruiting Fees for good strong labourers average from £6 to £8 per head. The laborers come to the Planter under an engagement of three years and as a rule renew the engagement for an additional three years. The wages paid amount to £10 each per annum with Food, principally Rice, Yams, Taro and Bananas.

Our Company, we might mention, was formed for the encouragement of British interests in New Hebrides and we have large tracts of land that may be purchased or leased at nominal figures by intending Planters.

We enclose herewith some copies of a pamphlet regarding settlement, also under other cover we send you sample of coffee grown.

We shall thank you to give the above a paragraph in your valuable Journal as we feel sure that many of your readers will be much interested in it.

Any further particulars may be had by applying to the undersigned.—Yours very truly,

p. THE AUSTRALIAN NEW HEBRIDES COMPANY, LIMITED,

Joseph Mitchell.

[Copies of circulars with the fuller information can be had at our office by any one interested.—Ed. *T.A.*]

LOCAL FRUIT AND VEGETABLES.

Kandy, Feb. 23.

Dear Sir,—Can any of your readers explain what part in the economy of nature the "Siamese Twin" plantains, to be found on every bunch of the fruit, play?

While on the subject of fruit, I feel certain our new Director of Gardens would earn the gratitude of the community, native as well as European, if he should turn his attention to improve the quality of the several descriptions of fruit and vegetables we possess in the island, many of the former are of fair flavour, but producing very little pulp. Cultivation has rectified this defect in many instances in Europe, and surely a like success may be looked for from efforts in the same direction out here. If I may, I would suggest that a plot of ground in the Peradeniya Gardens be devoted to the object I refer to.

PALAM.

TOBACCO IN CEYLON.

Feb. 26th.

Dear Sir,—In reference to your very interesting article upon the subject of Tobacco and enquiry as to the causes of its cultivation not being taken up by Europeans, may I venture to make a few observations. It appears that Mr. Vollar in his opinion that first rate cigar tobacco can be *grown* in Ceylon must be correct. The Sumatra experts, who commenced the business of the Tobacco Company, were attracted by what Mr. Vollar had *grown* and they showed their belief in it by becoming purchasers to a considerable extent, and as they were men of experience it seems clear that it was not any defect in growth that brought about the ultimate abandonment of the enterprize; but the curing of it was another matter. Still even that had been seen to by their experienced manager and prior to that Mr. Vollar and others had had a measure of success; but there were many other difficulties arose. Land could not be acquired in large blocks and it was necessary to get it on scattered pieces, hence we saw Dumbara, Katugastota, Wattegama, Ukuwela, Matale and Kurunegala all furnishing lands and these acquired slowly and no doubt expensively, for though the

land might be acquired at a low rate per acre it necessitated being done by a highly paid staff of Agents and Managers, local and expert, and others negotiating with natives and arranging titles. Besides all this, tobacco is far and away the most delicate and most dangerous cultivation. The greatest possible attention is required at every step. There is nothing to equal it in any Ceylon produce—the nurseries and insect attacks; the planting requiring an enormous force of labour at almost a moment's notice; and when caterpillars come as they must and will very frequently a similarly large force is needed. Subject to all sorts of danger from vicissitudes of climate and weather and quite open to destruction from a day or two of strong breezes it is difficult to find a district that would be really safe and nothing but a splendid market and a successful crop season could possibly repay the toil and failures of others. I believe, however, that the Sumatra experts were anything but satisfied that their tobacco did find full justice in the market, and probably the trade would hardly accept at fair value even good tobacco from a new source. We are not wanting in precedents for such treatment. I have not forgotten the efforts made by the late Mr. A. M. Ferguson in favour of Ceylon Tea in Australia against the interests vested in China—a thing of this sort requires years of opposition. You are correct in assuming that tobacco is still grown profitably by natives in Dumbara, and I may tell you that at Katugastota in the native gardens a good deal of money has been made there last year, and no doubt this has been done with the seed and with the experience picked up from the Tobacco Company's former buildings. J. M.

THE TOBACCO LEAF SALES OF THE CEYLON TOBACCO COMPANY.

Kandy, Ceylon, 27th Feb. 1897.

SIR,—With reference to the paragraph in the *Ceylon Observer* of Friday the 26th instant under the Heading "Tobacco" the net total amount realized by Tobacco Leaf Sales, after the Ceylon Tobacco Company, Ltd., went into Liquidation was *R11,307·64*.

The average price was a little over *R25* per cwt. all round, while there is no doubt that there was a ring of dealers to endeavour to keep the prices down as on more than one occasion I declined to accept bids with the result that a moderately good price was ultimately obtained all round.—I am, sir, yours faithfully,

A. PHILIP.

PRODUCE QUOTATIONS: LIBERIAN COFFEE.

DEAR SIR,—I notice in your issue of 25th March, the Chamber of Commerce Price Current of 23rd gives Liberian parchment "per bushel R8·25 very scarce;" but Mr. A. M. Chittambalam in his local market list printed in same issue of 25th gives the price as R12·50 per bushel (nominal.)

Do such quotations as R8·25 when the produce is scarce, compared to R12·50 its price a year ago, when it was not scarce, denote that we have now, once more to find this cultivation a delusion, and let it lapse into abandonment? Can you throw any light upon this sudden collapse? Are the Singapore merchants getting all the European and American orders or are there other sources and our crops too insignificant to count, or are our buyers so few as to afford no real market at all?

I have some fears that the cultivation is not greatly progressing as it is, but with such prices at R8·25 I presume it would be altogether discouraged. COFFEE.

TEA PRUNING, PLUCKING AND PREPARATION.

March 3.

DEAR SIR,—I cannot refrain from an exclamation of supreme surprise on reading the first replies to your queries *re* fall in prices. What on earth are V. A.'s made of, if they must needs wade through oceans of leaf on their way to their virtuous couches?

Give us practical men who can see an inch beyond their noses as our "Guides, philosophers and friends" or we'll continue to flood the market with inferior broken teas the cause of which is evidently hob nailed boots!—Yours faithfully,

FARMER.

[But let "Farmer" oblige us by sending his own answers to the circular-questions and so show how they ought to be dealt with. We have begun publishing the replies in the order of receipt and not by any process of selection.—ED. *T.A.*]

QUERIES ABOUT TEA.

MATALE WEST, March 4.

DEAR SIR,—Geo. White & Co.'s memorandum No. 157 dated Feb. 3rd is interesting. Take No. 1 with outlets, Nanuoya and Talawakelle, altitude of estates from 3,500 to 6,500 feet, the highest price obtained was 1/2½ and the lowest 6½d. How do you account for a difference of 8½d. Surely coarse plucking alone; or that combined with careless manufacture cannot account for this? Have aspect and soil anything to do with high prices? or is it that one was cultivated for a long number of years before being planted with tea? This will not hold good in all cases; as there are estates in most districts that secure top-prices although planted with coffee for a long time, while others planted in forest or chena get two prices.

Do some estates deteriorate faster than others? I can call to mind 2 estates that secured top-prices some years ago for 4 or 5 years in succession. The prices went lower and lower, till at last estates adjoining one of these secured higher prices, though formerly these was such a difference as 8d. and 9d. per lb. between them. How is it the Northern Districts get such low prices? One estate alone gets as much as 8d. though the elevation of some are 3,000 feet and more. Surely all the Planters of the Districts are not incapable men and a good many estates pluck rather fine. In Maskeliya, Dikoya and Bogawantalawa with outlet-Hatton—the highest price was 1/1 and the lowest 6¾d.

In Lower Dikoya, Kotmale &c., out-let Watawella and Nawalapitiya—elevation 1,500 to 4,500 there is not much difference in price, highest 8¼d, lowest 5¼d. and only 3 estates secured prices from 8d. to 8¼d. Why does Dimbula get higher prices than Dikoya? Is it owing to the lower rainfall and does a very high rainfall, *e.g.*, Matale District lower the price of tea.

A large number of estates all over the island at good elevation and with healthy bushes secure low prices. Superintendents and Conductors known to make good tea, are put on these. New and expensive machinery are put on. The price still remained low. How do you account for this?—Yours, PLANTER.

COARSE AND FINE LUCKING OF TEA.

Nawalapitiya, March 8.

Dear Sir,—Now that the discussion in your columns *re* coarse plucking and rubbishy tea, with over-production—the inevitable results of such a method being adopted—is being freely ventilated, will not the figures given below be a poser to our V.A.'s and Directors of our Ceylon Tea Companies as to this suicidal policy which hereafter means death to the shareholders and other proprietors of tea!

Take for example the Celestial Empire: heavenly John's fate was sealed when Ceylon stepped in with a tea equal to any in the world and by miles superior to that being heaped on the market by John Chinaman & Co. What followed we all know. With this recent knowledge well before us, if we are to go on glutting our already overstocked market with tea that John was wont to supply when he had it all to himself, can we doubt the results? "Give a dog a bad name, &c." has been veritably proved in the case of John Chinaman, and if we persist in our mad career that such will be our experience in the near future is not a mere nightmare. To obtain a sound reputation takes tons of gold, but to secure a bad one you need hardly spend a brass farthing. "To be forewarned is to be forearmed." Let us therefore in 1897 rise to the occasion ere the death-knell is sounded over Ceylon's spicy teas. There is this frivolous excuse which some are always ready to advance.—"If we drop in our exports, others will rise up. Let them! All I say is those countries which will flood the markets with rubbishy teas will soon find their doom; whilst we in Ceylon, if we *now* strike the happy medium and keep to it steadily, shall and will have the sweet comfort of knowing that our teas are an established staple for years to come.

Now for my table produced by humble efforts:—"Quality *vs.* Quantity"—which will also do away with the clamour for laborers, a grand reduction of the labor force being an undoubted outcome.

Estate supposed to yield, say 100,000 lb. tea annually; coarse plucking.

Average 6d. a lb. = £2,500-0-0. Same estate 80,000 lb.; fair plucking; average 7d. = £2,333-6-8. Difference = £166-13-4.

Cost of extra 20,000 lb. tea at, say 4d.

Will land you in	£333	6	8
Profit on coarse leaf	166	13	4
Difference in expenditure	166	13	4
80,000 lb. tea at 7d.	£2,333	6	8
Difference in expenditure	166	13	4
	£2,500	0	0

Put that in your pipe and smoke it, ye croakers of "quantity pays"! What about wear and tear of machinery, &c., &c., saved? C. T.

P.S.—Whether I produce 100,000 or 80,000 I can safely do both at 4d. a lb. Difference in plucking won't affect it: it may the first 2 months or so till Menatchie gets up to the new style of plucking; and ever after your averages are precisely the same as if you were plucking an extra leaf or even ½ a leaf.

[Has "C. T." observed that a great many of the letters in answer to our circular, deny that the plucking is any coarser than it has been all along?—Ed. *T.A.*]

HOW TO DEAL WITH UNPROFITABLE LOWCOUNTRY TEA.

Matale West, March 11.

Dear Sir,—I was looking over the prospectus of the Talgaswella Tea Company and the Estimate (made if I am not mistaken by Mr. T. C. Owen) for opening 500 acres in tea. It showed at the end of 3½ years, a profit of 22½ per cent. How has this been fulfilled?

Waterholing should be tried in dry districts, where the land has been drained properly, and where it is not too steep.

I had a very poor piece of tea where I tried this. The cost was about R7 to R8 per acre and the yield was doubled, and the field has continued to give double for the last 5 years. Might not this be tried on Talgaswella where the climate is hot and the evaporation consequently great; especially as some of the land is said to be sandy. All the rainfall, or nearly all, will be absorbed and the tea will flush well during the drought. Again should shade not be tried? I do not know if Grevilleas grow well in the low-country, but Dadap and Albizzia Mollucana do. They might be planted originally 10′ × 10′ and after 2 years or so when the trees grow, they should be thinned out and the distance might be 20′ × 20′ or more. Leguminous plants enrich the soil and the experiment if tried will not cost much, and cannot in any case do damage.—Yours truly, PLANTER.

ENEMIES OF TEA.

Maligatenne Estate, Veyangoda, March 15.

Dear Sir,—Enclosed in a match box you will receive by post a worm or a grub which attacks tea trees. It was found under the following circumstances. Observing a small collection of what appeared as a heap of saw dust at the foot of a tea tree of two years' growth, I examined the tree and found a small hole at the foot of the tree about 1-8th of an inch from the ground. I probed it and found the hole to take an upward direction. I cut down the tree and laid it open, and found the grub about 8 inches from the hole up the tree. As the above information may be of some use to tea planters, I thought it right to send it to you.—Yours truly,

C. L. H. DIAS BANDARANAYAKA.

[The "grub" is the larva of the Borer, *zeuzera coffeæ*, described in Mr. E. E. Green's 'Insect pests,' page 8. It is an old enemy of coffee, though never a widespread one in Ceylon. It is also found in tea, but not in such numbers as to need any special efforts to check them.—Ed. *T.A.*]

APPOINTMENT OF A SPECIALIST TO INVESTIGATE CACAO DISEASE.

Sir,—Cacao growers will be gratified to hear that the Government intends to have the cause and nature of the pest which has in some places done so much damage to the red variety of cacao investigated, and I believe, the services of a competent specialist will be secured. Our thanks are due to H. E. the Governor for having promptly interested himself in the matter.—Yours faithfully, THOS. NORTH CHRISTIE.

St. Andrews, Maskeliya, March 22nd.

TEA CHESTS

In the multitude of counsellors there is safety. And apart from the local supply of timber for tea boxes—very limited, we fear—and the supply from Japan, which, some people think, may any day be restricted, it is a comfort to think that so much is being done in this direction, both in Europe and America. At the head of the home list in importance must be placed, the Glasgow Acme Steel Chest Company, which has already got so great a hold on Indian tea planters, that its Directors have felt justified in securing and erecting special works for their operations, and are about to increase the capital of the Company. They have got a most energetic capable Manager in an Aberdonian gentleman, who was trained as an Analytical Chemist; but whose keen business habits had attracted attention. Still, in his first year he was able, as Chemist, to show his Directors, how they could save £500 a year in their manipulation of the steel plates; and we may expect the "Acme" people to go on improving their style of chest which they hope erelong to turn out at the rate of a million a year.

A tea box owned by a London Syndicate, and in the invention of which, an old Ceylon planter, Mr. J. C. Roberts, was prominent, is specially praised for the equal tares, it is likely to secure, as well as for its lightness and cheapness. A special celluloid preparation is used, backed by very thin steel, and the steel and cardboard make the chests very flexible. Cut across in two, these are readily convertible into half-chests. Dawson's Baltic timber box for tea is said to be both cheap and good; and so is a Canadian tea-chest, which it is hoped to supply largely to India and Ceylon. And lastly we have in our midst, as lately announced in full detail, the "Venesta" tea chest. We have heard remarks made as to a recent testing of these chests, on a Dimbula estate, that it is a pity that the rival boxes were not filled with precisely the same quantities, or rather weights, of say, dust tea, and that then the test applied could not prove otherwise than equal and fair.

The time is, no doubt, approaching—say at the next Agri-Horticultural Show in Colombo—when not only Tea Machinery of all descriptions, but all the varieties of tea chests can be shown and even tested, to some extent, simultaneously. Meantime, it is satisfactory to know that there is no chance of a failure of supply, nor yet of a monopoly in any one direction, in this important item of a tea producer's stock-in-trade.

THE KALUTARA COMPANY, LIMITED.

The annual ordinary general meeting of the above Company was held at the Company's Offices, No. 7 Queen Street, Fort, Colombo, on the 18th March.

The following is the report:—

ACREAGE.

Tea in bearing	..	425 Acres
Tea not in bearing	..	153 "
Arecanuts, Grass, &c.	..	7 "
		585
Forest	..	499
Total	..	1084

The Directors have now the pleasure to submit to the Shareholders the Accounts for the period from 1st April to 31st December, 1896

The Crop during that period was 153,477 lb. Tea, which realized a net average of 39½ cents per lb.

After making ample provision for depreciation of Buildings and Machinery, there is a balance at credit of Profit and Loss Account on the nine months working of R21,053·40, equal to 7 per cent per annum on the Capital of the Company. After writing off the whole of the preliminary expenses (R3,995·99), the balance available amounts to R17,057·41. The Directors now recommend the payment of a Dividend of 4 per cent, which will absorb R16,000 and leave a balance of R1,057·41 to be carried forward to the current season.

The estimate for this year is 195,000 lb. Tea from the 425 acres in bearing on an expenditure of R17,653·58, which includes a sum of R6,000 to be expended in manuring 120 acres.

The estimated expenditure on Capital Account is R32 350 11, which provides for the upkeep of the 153 acres not in bearing, the planting up of additional clearings, in extent 82 acres, and the cost of a new withering shed.

Mr. C. A. Leechman having retired from the Board, Mr. J. G. Wardrop was nominated to the vacancy thus occasioned.

In terms of the Articles of Association all the Directors now retire, but are eligible for re-election.

The appointment of an Auditor for the current year will rest with the Meeting.—By order of the Directors. WHITTALL & Co.
Colombo, 5th Mach 1897. *Agents and Secretaries.*

INDIAN PATENTS.

The fees prescribed have been paid for the continuance of exclusive privilege in respect of the undermentioned inventions for the periods shown against each:—

IMPROVED HULLER FOR RICE, COFFEE, AND GRAIN.—No. 73 of 1892.—Edward Lennon Cantwell, civil engineer and patent agent, of 5, Old Post Office street Calcutta, for an improved huller for rice, coffee, and grain, and for scouring and cleaning rice, wheat, and every discription of grain. (From 1st March 1897 to 1st March 1898.)

IMPROVEMENTS IN THE METHOD OF, AND APPARATUS FOR, DRYING TEA LEAF AND THE LIKE.—No. 152 of 1892.—Henry Thompson, engineer, of Ipswich, in the county of Suffolk, for improvements in the method of, and apparatus for, drying tea leaf and the like. (From 10th March 1897 to 10th March 1898.)—*Indian and Eastern Engineer*, March 20.

MANURING TEA WITH BULKY MANURES.—An experienced planter, now at home, writes:—"By the way didn't I once mention to you that when planters were manuring with bulky manures, that great care should be taken not to cut the side roots. I have seen a great deal of careless work done that way, and I can't think in a case of that sort the manure is likely to benefit the tree, when its feeding roots are cut. Coolies are excessively careless when holing, and are certain to cut large numbers of roots unless strictly prohibited from doing so. A kind of special hoe should be used with blunted edge, to draw the earth back from the stem of the tree where it enters the ground, not to cut a hole to deposit the manure in, for if the hole is cut with a sharp holing mamotie, such as is used in cutting roads or drains, the large side roots are almost certain to be cut through."

DEAFNESS. An essay describing a really genuine Cure for Deafness, Ringing in Ears &c., no matter how severe or long-standing, will be sent post free.—Artificial Ear-drums and similar appliances entirely superseded. Address THOMAS KEMPE, VICTORIA CHAMBERS, 19, SOUTHAMPTON BUILDINGS, HOLBORN, LONDON.

BOWSTRING HEMP.

The plant which yields this fibre is known botanically as *Sanseviera Zeylanica*, and to the Natives of Ceylon as "Niyanda." The fibre is largely used by the Kandyan people in the making of fine coloured whips and mats, and for such purposes the work of extraction is done by manual labour. Some attempts have been made to grow the plant commercially and for export, and notably by Mr. C. Shand who, in the time of coffee depression, worked up Sanseviera among other fibres but could not get it to give a profitable yield of clean fibre. It should be mentioned, however, that Mr. Shand used a self-made and comparatively crude machine for extraction and that this fact may account for his failure to grow the plant remuneratively.

Sanseviera is once more brought to the notice of tropical planters and this time as a second or catch crop on tea-land, to be grown on those portions of estates not required and not suitable for tea. In this connection it forms the subject of a bulletin, issued by the Government of India, as one of their useful Agricultural Ledger series of publications. It is universally admitted, says the bulletin, that such a crop is much needed, and considerable attention has, of late, been given to the subject, with the result that Bowstring Hemp may possibly come to be so cultivated. Rhea fibre has also been spoken of as a secondary crop to tea, but Dr. Watt, Reporter on Economic Products to the Government of India, states that there is room for both fibres, that some districts might find Bowstring Hemp more convenient and equally profitable to rhea, and that these are fibres which will meet independent demands and can never enter into competition.

On samples of Indian Sanseviera fibre being submitted last year to Mr. T. H. Christy, he valued the stuff at £16 to £17 per ton, but added that had the colour been bright white instead of yellow he would have put down the value at £20 per ton. "This fibre," he remarks, "will sell easily." Mr. C. E. Collyer, Reporter on fibres to the Imperial Institute, states that with the present low market for fibres Bowstring Hemp equal to the Indian samples will not fetch more than £20 per ton in London, but when more carefully prepared and of the usual good strength and colour the value will probably be £25 and upwards. In a subsequent report, Mr. Collyer adds that the quality of the fibre will be much improved by the use of suitable decorticating machines and so far as any fibre has come to market the best results have been from the improved "W. E. Death" machine which turns out about 6 cwt. per day at a cost at least as small as by any other system. Another important remark made by Mr. Collyer is to the effect that soil and climate have much to do with the quality of the fibre as also does the choice of the right variety of Sanseviera.

As regards cultivation a note by a West Indian planter is the only information which the bulletin under review records. It appears that the plant grows best in moderate shade in black soil; the propagation is easy from either cutting from stems or from roots: the plants should be about 18" apart, and 18" between the rows; the soil should be moist but not wet; growth is much more rapid under shade than in the hot sun, and the quality of the fibre is better. The plants are said to be ready for cutting in from 9 to 12 months and may be cut at any season, except after a long drought when the fibre is apt to be harsh and tender. The plants attain nearly double the height in black soil and shade compared with red soil and in the sun and the fibre of the freely growing plant is naturally much superior. Authorities, however, would seem to differ as to the time when the first crop could be taken, some being of opinion that the first crop should not be taken till after 3 years, while others give 12 months as the time. In a communication to the Kew Bulletin, 3,000 plants per acre is given as the rate of planting, that is planting 3' by 3', making allowance for roads, &c. The estimates of crop also naturally differ to some extent. Some authorities say that 40 lb. of fresh leaves 3½ to 4 ft. long give 1 lb. of clean fibre or over 1,600 lb. per acre per crop —two crops being got in a year. Roxburgh estimates the crop obtainable for one acre at 1,613 lb. and that two such crops could be got in a year from good soil in favourable seasons and with plants of the proper age, that is 1½ ton per acre per annum at the end of 3 or 3½ years.

Sanseviera Zeylanica grows luxuriantly in a wild condition in many of the forests in Ceylon from whence it is collected by the natives for such local manufactures as those already referred to. A trial with the plant on stiff soil in the Matale district proved a failure, nor did experiments with this and other varieties of Sanseviera on sandy soil and in the open succeed on the premises of the Agricultural School in Colombo—results which go to support the opinion of the West Indian planter recorded above, that the plant affects shady localities and vegetable soils, (conditions which are present in forest lands). The Superintendent of the Agricultural School in 1895 had some rope made out of fibre extracted from Sanseviera which was obtained from the Kurunegala district, and submitted a sample for an expert opinion through the Crown Agents for Ceylon. The report of Mr. Thomas Briggs (which was published in the *T. A.* of Oct. 1895) was to the following effect :—"The ropes or better called lines look very well and would sell here as they are if snipped in coils. All these, Nos. 1 and 2 (*Sanseviera Zeylanica* and *Fourcroya Gigantea*) are worth about £20 per ton delivered in London."

We have no doubt that some of our enterprising planters will be inclined to give a fair trial to Sanseviera as "second fiddle" to tea, after having satisfied themselves by reference to the Director of the Peradeniya Gardens as to the best variety of the plant, from an economic point of view, for cultivation in the lower tea districts.

WYNAAD PLANTERS' ASSOCIATION.

We extract the following from the minutes of a general meeting held at Meppadi Club on March, 3rd :—

COFFEE PASSES.—Read semi-official from the Superintendent of Police Malabar, pointing out how very important it is that passes should be always accurately made out, as the system of passes is a factor in the prevention of Coffee stealing on the road, which planters would do well to make the most of. At present many are inaccurate. Sometimes the signature, sometimes the date or some other important particular is omitted which makes the pass valueless.

OUTTURN OF COFFEE.—Read letter from Capt. Carslake R. N. The Honorary Secretary was instructed to thank Capt. Carslake for his letter, and to point out that Europeans are employed to check the measurement of coffee in the curing yards; and that seamless bags are obtainable through the agents

but the Association think that it is practically impossible to arrive at any fixed standard of moisture in coffee applicable to Wynaad, the Coast and London.

THE QUEEN'S JUBILEE.—Read circular proposing the presentation of an address to Her Majesty by the U. P. A. S. I. & draft of the same. Cordially approved.

COFFEE ASSOCIATION.—Read circular on the proposed formation of an Association to promote the sale of coffee. Recorded.

NEW MEMBER.—Mr. J. W. Handiy was elected a member of the Association.

THE UNION ESTATES COMPANY OF CEYLON, LIMITED.

The annual ordinary general meating of the above Company was held at the Company's Offices, No. 7 Queen Street, Fort, Colombo, at 1 p.m. on Saturday, 27th March, 1897.

The Directors' report was as follows :—

ACREAGE.

	Tea in partial bearing.	Tea in full bearing.	Tea not in bearing.	Cocoa.	Total Cultivated.	Grass, Jungle & Waste land.	Total.
Hayes and Gongalla	508	9	8	—	525	1,254	1,779
Dea Ella	189	50	—	70	309	177	486
	697	59	8	70	834	2,431	1,265

(Ou Dea Ella 260 acres of tea are interspersed with oconuts.)

The Directors have now the pleasure to submit to the shareholders the accounts of the Company for the past year.

The tea crops considerably exceeded expectations, having amounted to 305,092 lb. against the estimate of 265,000 lb. At date accounts have still to be received from London in connection with the sale of 33,545 lb. Hayes Estate Tea upon which a reasonable estimate of value has been placed. The 271,547 lb. for which account sales have been rendered have realized a net average of 37¼ cents per lb.

The cocoa crop amounted to cwt. 52-0 18, which realized only a net average price of R31·82 per cwt.

The cost of delivering the crops into Colombo amounted to R89,820·30 against the estimate of R87,065. The excess of expenditure over estimate, is fully acconuted for by the additional crop secured.

After making ample provision for depreciation of Buildings and Machinery, the result of the year's working, including a small balance from 1895, shews a sum available for distribution of R23,014·09. The Directors recommend a dividend of 7 per cent for the year, which will absorb R22,400, and leave a balance of R614·09 to be carried forward.

The question of improving the transport facilities to and from the Estates has engaged much of the attention of the Directors. Work on the Grant-in-Aid road from Demyaya to Anningkande is progressing, and it is hoped that this section will be finished about June. The Directors have joined in an application to further extend this road from Anningkande to Hayes Factory, and it is hoped that work on this section will soon be commenced. So far the application made for the improvement of the Dea Ella outlet has not been acceded to, but the matter has again been brought to the notice of Government.

The crops estimated for 1897 are 307,550 lb. tea and 70 cwt. cocoa, and the expenditure on working account is estimated at R93,388, which includes cost of manufacturing 25,000 lb. tea for a neighbouring estate. The outlay on capital account is not yet estimated, as it depends largely on the continuation of the road to Hayes.

Mr. G. W. Carlyon having resigned his seat on the Board on leaving the Island, Mr. Alex. Thomson was appointed to fill the vacancy. Mr. W. D. Gibbon retires by rotation and is eligible for re election. Mr. Chas. Young has retired from the Board, which vacancy it rests wit the meeting to deal with.

An Auditor has to be appointed for the current year.—By order of the Directors.

WHITTALL & Co.,
Agents & Secretaries.

Colombo, 15th March, 1897.

GOW, WILSON & STANTON'S INDIAN AND CEYLON TEA SHARE REPORT.

London, E.C., 10th March, 1897.

The uneasiness generally felt in regard to European politics naturally tends to curtail investment business, and inquiries for shares have consequently been limited. Holders, however, have shown but little desire to part with their securities except at previous quotations, but in cases where prices were slightly reduced, investors have generally come forward to absorb anything offered.

The Indian market has been very strong during the past fortnight, and owing to the scarcity of low price grades, considerably better rates have been obtainable for these, while the good useful quality of the autumn crop is proving a source of revenue to the tea gardens, owing to the high prices ruling for this class of tea. Not much of the season's crop now remains to be disposed of, and the recognition of this fact has no doubt assisted to raise quotations in the market.

The Ceylon tea market has shown an advance during the fortnight, and the average price has recently somewhat improved. All the lower grades of whole leaf tea are in strong demand at improved quotations.

Dividends.—Associated Tea Estates Co., an Interim of 3 per cent on both preference and ordinary. The Leesh River Co. have declared a dividend of 6 per cent for the year, 1896.

PLANTING IN NYASSALAND.—We are indebted to Mr. J. W. Moir, a well-known pioneer planter on the Shire Highlands, B. C. Africa, for the following corrections and interesting information: the Map referred to is the one appended to the latest Report of Commissioner Johnston and which we reviewed in the *T.A.* Mr. Moir writes :—

"It is pleasant to know you take so much interest in our districts. There are some very funny things about Sir H. Johnston's Map. Five of my estates are missed out altogether of 11,000 or 13,000 acres. One (surveyed) is at Chiromo, and so perhaps more or less out of the Map, one is certainly not surveyed yet. But two that were surveyed at the very same time as several others which are mapped, are not in. And the Pioneer estate, opened by H. Brown is likewise left out; why, I cannot say.

"I daresay you would see that some of our coffee (mine) fetched up to 105s 6d for peas: and 95s for flats: but this was rather overdried, as I found on making careful experiments and weighings in London lately. So it had lost a little colour. We shall do better yet. Things promise better for the future."

CHAFED SKIN, PILES, SCALDS, BRUISES, CUTS, STINGS, NEURALGIC and RHEUMATIC PAINS, SORE EYES, EAR-ACHE, THROAT COLDS, and SKIN AILMENTS quickly relieved by use of CALVERT'S CARBOLIC OINTMENT.
Large Pots 13½d. each (English rate). Sold at Chemists, Stores, &c.
F. C. CALVERT & CO., Manchester.

COLOMBO PRICE CURRENT.

(*Furnished by the Chamber of Commerce*).

Colombo, Mar. 30th, 1897.

EXCHANGE ON LONDON: CLOSING RATES, *Bank Selling Rates*:—On demand 1/3 1-16; 4 months' sight 1/3 3-32; 6 months' sight 1/3¼. *Bank Buying Rates*:—Credits 3 months' sight 1/3¼; 6 months' sight 1/3 5-16. Docts 3 months sight 1/3 9-32; 6 months' sight 1/3 11-32.

COFFEE.—Plantation Estate Parchment on the spot per bus., R16·50 Very scarce. Estate Crops in Parchment, delivery no quotations. Plantation Estate Coffee, f.o.b. on the spot per cwt. R85·00. Liberian parchment on the spot per bushel, R9 00. Garden and Chetty Coffee, f.o.b. per cwt. no quotations. Native Coffee f.o.b. per cwt. R67·00 Nominal.

TEA.—Average Prices ruling during the week Broken Pekoe, per lb. 49c. Pekoe per lb. 39c. Pekoe Souchong per lb. 30c. Broken mixd and Dust, per lb. 24c. Averages of Wednesday's sale.

CINCHONA BARK.—Per unit of Sulphate of Quinine per lb 03c.—1 to 5%

CARDAMOMS.—per lb, R2·50.

COCONUT OIL.—Mill oil per cwt. no quotations. Dealers' oil per cwt. R12·75. Coconut oil in ordinary packages f.o.b. per ton R300·00 to 295·00.

COPRA.—Per candy of 560 lb. R36·00 to 45·00

COCONUT CAKE: (Poonac) f.o.b. (native) per ton. R67·50.

COCOA.—Unpicked and undried, per cwt. R46·00.

COIR YARN.—Nos. 1 to 8 { Kogalla R18·00 / Colombo R14·00

CINNAMON.—Nos. 1 & 2 only f.o.b. Out of season.

Do Ordinary Assortment, per lb. do

EBONY.—per ton No sales.

PLUMBAGO:—Large Lumps per ton, R330 } Very firm.
Ordinary Lumps per ton, R300
Chips per ton, R170. Dust per ton, R100

RICE.—Soolye per bushel, { R3·55 to 3·80
,, per bag, { R9·00 to 10·90
Pegu and Calcutta Calunda R9·85 to 11·00
Coast Calunda per bushel, R3·50 to 4.10
Muttusamba per bushel, R3·65 to R4·20.
Kadappa and Kuruwe per bushel, R3·45 to 3·65.
Rangoon Raw 3 bushel bag —R11·50 to 12·00

FREIGHTS.

Cargo.	Per ton London per str.	N. York per str.	Trieste per str.	Mar'lles per str.	Hamb', Bremen &c.
	s. d.	s. d.	s. d.	R. c.	s. d.
Tea	20/	31/3	22/6	25	20/
Coconut Oil	20/	31/3	22/6	25	20/
Plumbago	17/6	31/3	22/6	25	20/
Coconuts in bags	20/	31/3	22/6	25	20/
Other Cargo	20/	31/3	22/6	25	20/
Broken Stowage	10/	..	..	..	..
SAILERS.					
Coconut Oil	..	30/		..	..
Plumbago	..	28/9	..	..	..

LOCAL MARKET.

By Mr. A. M. Chittambalam, 7, Baillie St., Fort

Colombo, Mar. 31st, 1897.

Garden Parchment :— Scarce per bushel
Chetty do :— (Nominal) R13·25 to 13·50 do
Native Coffee Scarce:— R65·00 to 65·00 per cwt
do f.o.b. do :— R70·00 to 71·00 do
Liberian Parchment, R12·50 per bushel (nominal)
do Coffee R63·00 to 64·00 per cwt
CARDAMOMS.— R1·50 to 2 per lb (nominal)
COCOA.—(nominal) R30·00 to 40·00 per cwt do
RICE.—Market is quiet :—
Kazla (Scarce)
Soolye R9·25 to 10 per bag
Callunda (Scarce)
Coast Callunda (Scarce) 3·60 to 3·70 per bushel
Kara 3·50 to 3·60 do
Muttusamba 3·62 to 3·87 do
CINNAMON.—Quoted Nos. 1 to 4, at 60c and Nos. 1 and 63 cents per lb (nominal)
CHIPS.—R85·00 to 87·50
COCONUTS.—Ordinary R32 to 38 per 1,000 (nominal)
do Selected 40 to 44 do do
COCONUT OIL.— 13·00 to 13·37 per cwt do

COPRA.—Market steady :—
Kalpitiya R41 to 42 per candy
Marawila 38 to 40 do
Cart Copra 33 to 36 do
POONAC.—Gingelly 85 to 90 per ton
Chekku 95 to 100 do
Mill (retail) 70 to 75 do
EBONY.—quotations at R100 to R195 (nominal)
SATINWOOD.—cubic feet 2·00 to 2·25 do
HALMILLA.— do 1·25 to 1·50 do
KITUL FIBRE.—Quoted at R28·00 per cwt (nominal)
PALMYRA FIBRE.—Quoted nominally :—
Jaffna Black.—Cleaned (Scarce)
do Mixed R16·00 to 17·00 per cwt.
Indian do R7·00 to 9·00 do
Do Cleaned 10·00 to 14·00
SAPAN WOOD.—Quoted 45·00 to 50·00 per ton
KEROSINE OIL.—American 7·50 to 7·55 per case
do Bulk Russian 2·72 to 2·77 per tin
do Russian in Cases R5·90 to 5·95 per case
KAPOK.—Cleaned f. o.b :— R29·00 to 30·00 per cwt
do Uncleaned Scarce do
Croton Seed do do
Nux Vomica 2·50 to 3·00 do

CEYLON EXPORTS AND DISTRIBUTION 1896-97.

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1897 B'nch & Trunk lb	Tea. 1897 lb.	Tea. 1896 lb.	Cocoa cwt.	C'moms lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil 1897 cwt.	Coconut Oil 1896 cwt.	P'bago 1897 cwt.
To United Kingdom ..	3077	..	2077	16273	21692137	20508196	13275	101713	303095	85528	11228	28693	31058
,, Austria	247	2	219	..	1305	1515	..	..	5100	2410	5369	7802	.
,, Belgium	..	..	..	..	1965	3440	..	..	59468	6216	..	904	6713
,, France	599	..	599	..	15587	14739	121	..	20000	6160	..	..	202
,, Germany	115	..	115	..	47842	24120	54	17201	105215	111672	..	2549	11366
,, Holland	58	..	58	..	3705	.	..	..	..	..	..	.	..
, Italy : ..	..	..	-	..	215	1006	..	..	29900	38080	..	103	1
,, Russia	..	..	..	..	31098	46878	..	..	..	..	...	..	..
,, Spain	..	..	..	..	500	9680	..	..	20000	..	...	208	..
,, Sweden	..	..	...	..	1850	..	..	..	..	..	..	..	..
,, Turkey	..	..	..	..	1790	3062	...	..	..	..	.	..	..
,, India	24	..	24	...	119557	259926	5	12013	61	...	24452	9480	42
,, Australia	539	..20	559	..	2385099	2196840	60	25	..100	7280	. 836	.	276
,, America	..	..	...	97832	208465	60126	..	..	20000	..	5012	9513	20616
,, Africa	..	..	..	..	35732	15746	..	..	..	..	..	..	..
,, China	40	..	40	125 5	100769	34568	..	.	..	..	204	758	56
,, Singapore	..	..	.	..	6265	28375	121	..	..	..	7536	2904	..
Mauritius	..	..	...	..	..	..	..	..	..	..	..	..	..
, Malta	..	..	..	..	..	32100	..	..	..	..	..	..	..
Total exports from 1st Jan. to 30th Mar. 1897	4699	22	4721	126640	24653431		13636	130952	562969	257736	50637		70355
do 1896	6058	171	6229	115038	23240317		12459	88185	345575	211463	62914		87641
do 1895	20255	378	20633	251931	21614707		12891	127911	4 8946	159384	82004		54517
do 1894	7394	85	74 9	617749	21375622		6859	95494	354341	96682	87199		70925

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Prices Current, London, March 10th, 1897.)

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine ...	Fair to fine dry ...	44s a 120s
Zanzibar & Hepatic	Common to good ...	11s a 76s
BEES' WAX,		
Zanzibar & Bombay { White ..	Good to fine ...	£7 a £8
Yellow...	Fair ..	£6 a/ £6 10s
Mauritius & Madagascar..	Dark to good palish .	£5 12 6 a £6 2/6
CAMPHOR, China ...	Fair average quality ...	11 s
Japan ..	,, .. nom...	120s
CARDAMOMS, Malabar..	Clipped, bold, bright, fine	3s a 3s 1d
	Middling, stalky & lean	2s 9d a 2s 10d
Ceylon.—Mysore ...	Fair to fine plump ..	3s a 4s
	Seeds ...	4s
,, Tellicherry...	Good to fine ..	2s 9d a 3s
	Brownish ..	2s 6d
,, Long ...	Shelly to good ...	2s 6d a 2s 8d
,, Mangalore .	Med brown to good bold	3s 6d a 3s 9d
CASTOR OIL, Calcutta..	1sts and 2nds ...	3½d a 4½d
Madras .	...	3½d
CHILLIES, Zanzibar ..	Dull to fine bright ..	20s a 37s 6d
CINCHONA BARK.—		
Ceylon ..	Ledgeriana Chips ...	1d a 3½d
	Crown, Renewed ..	2d a 4¼d
	Org. Stem	1¼d a 3d
	Hybrid Root ..	2¼d a 2¼d
	Chip ..	1¼d a 2d
CINNAMON, Ceylon 1sts	Ordinary to fine quill...	11½d a 1s 6d
2nds	,, ,, ...	10½d a 1s 5d
3rds	,, ,, .	10½d a 1s 4d
4ths	,, ,,	9½d a 1s 1d
Chips	Fair to good	3d a 3¼d
CLOVES, Penang ...	Dull to fine bright bold	4¼d a 10d
Amboyna ..	Dull to fine	3d a 4½d
Zanzibar }	Good and fine bright	2 5-16d a 2¼d
and Pemba }	Common dull to fair	2¼d a 2 3-16d
Stems ..	Fair .	1d
COCULUS INDICUS ...	Fair .	7s a 9s
COFFEE ...		
Ceylon Plantation	Bold to fine bold colory	116s a 127s
	Middling to fine mid	110s a 114s
	Low mid. and low grown	100s a 108s
	Smalls ..	92s a 99s
Native ...	Good ordinary ..	70s a 86s
Liberian ...	Small to bold ..	75s a 80s
COCOA, Ceylon ..	Bold to fine bold ..	72s 6d a 82s 6d
	Medium and fair ..	65s a 70s
	Triage to ordinary ..	30s a 60s
COLOMBO ROOT... ..	Fair to good ..	20s a 22s 6d
COIR ROPE, Ceylon ..		nominal
Cochin ..	Ordinary to fair	£10 a £16
FIBRE, Brush ..	Ord. to fine long straight	£10 a £21
Cochin ...	Ordinary to good clean	£15 a £21
Stuffing	Common to fine	£5 a £6 10s
COIR YARN, Ceylon ..	Common to superior	£12 a £26 10s
Cochin ..	.. very fine ..	£12 a £34
do.	Roping, fair to good	£10 10s a £13
CROTON SEEDS, sifted..	Fair to good ...	55s a 86s
CUTCH	Fair to fine dry ..	9s 3d a 32s 6d
GINGER, Bengal rough	Fair ...	15s 6d
Calicut, Cut A	Good to fine bold ..	70s a 85s
B & C	Small and medium	32s a 67s 6d
Cochin Rough...	Common to fine bold	27s a 36s
	Small and D's ..	10s a 25s
Japan ..	Unsplit ...	18s
GUM AMMONIACUM ..	Sm. blocky to fine clean	17s a 36s 6d
ANIMI, Zanzibar...	Picked fine pale in sorts	£10 7s 6d a £13
	Part yellow and mixed	£7 17/6 a £10 10s
	Bean and Pea size ditto	70s a £7 12/6
	Amber and dk. red bold	£5 10s a £7 10s
	Med. & bold glassy sorts	90s a 137s 6d
Madagascar ...	Fair to good palish	£4 8s a £6 15s
	.. ., red	£4 5s a £9
ARABIC E. I. & Aden ...	Ordinary to good pale	50s a 62s 6d
Ghatti ..	Pickings to fine pale	20s a 55s
Kurrachee	Good and fine pale ..	55s a 65s
	Reddish to pale selected	35s a 45s
Madras ...	Dark to fine pale ..	37s 6d a 45s
ASSAFŒTIDA ...	Clean fr to gd. almonds	40s a 80s
	Ord. stony and blocky	30s a 37s
KINO ..	Fine bright ...	£45 a £55
MYRRH, picked ..	Fair to fine pale ...	80s a 90s
Aden sorts	Middling to good ...	33s a 65s
OLIBANUM, drop .	Good to fine white ...	34s a 60s
	Middling to fair ...	20s a 31s
pickings	Low to good pale ...	11s a 12s 6d
siftings	Slightly foul to fine ...	9s 6d a 14s
INDIARUBBER, Assam	Good to fine ...	1s 10d a 2s 4d
	Common to foul & mxd.	3d a 1s 6d
Rangoon ..	Fair to good clean ...	1s 4d a 2s 1d
Borneo ...	Common to fine ..	1s 1d a 1s 8d

	QUALITY.	QUOTATIONS.
INDIARUBBER, *(Contd).*		
Java, Sing. & Penang	Foul to good clean ..	1s 3d a 2s 3d
Mozambique {	Good to fine Ball	2s 2d a 2s 6d
	Ordinary to fair Ball	1s 2d a 2s 1¾d
	Low sandy Ball	10d a 1s 1d
	Sausage, fair to good	1s 4d a 2s 5½d
	Liver and livery Ball	1s 3½d a 2s 1½d
Madagascar {	Fr to fine pinky & white	1s 11d a 2s 5d
	Fair to good black	1s 3d a 1s 10d
	Niggers, low to good .	10d a 1s 5d
INDIGO, E.I. ...	Bengal--	
	Shipping mid to gd violet	4s 4d a 5s 1d
	Consuming mid. to gd.	3s 4d a 4s 1d
	Ordinary to mid. good	2s 8d a 3s 2d
	Mid. to good Kurpah..	2s a 2s 10d
	Low to ordinary	1s 3d a 1s 11d
	Mid. to good Madras .	1s 4d a 2s 6d
MACE, Bombay, & Penang	Pale reddish to fine ..	1s 9d a 2s 9d
	Ordinary to fair ..	1s 4d a 1s 8d
	Chips and dark	1s 1d a 1s 6d
MYRABOLANES, Madras	Dark to fine pale UG	3s 9d a 5s 6d
	Fair Coast	4s 9d
Bombay	Jubblepore ...	4s a 7s
	Bhimlies ..	4s 3d a 8s 6d
	Rhajpore &c. ..	4s a 7s
Bengal ..	Calcutta ..	4s a 6s
NUTMEGS—	64's to 57's ..	3s a 3s 2d
Bombay & Penang	112's to 67's ..	1s 1d a 2s 11d
	160's to 130's	9d a 1s
NUTS, ARECA ...	Ordinary to fair fresh .	12s a 14s
NUX VOMICA Bombay	Ordinary to middling	5s a 6s 6d
Madras	Fair to good bold fresh	7s a 7s 6d
	Small ordinary and fair	6s 6d
OIL OF ANISEED ...	Fair merchantable	6s 7½d a 6s 9d
CASSIA ..	According to analysis	6s 6d a 9s
LEMONGRASS ..	Good flavour & colour	2⅜d
NUTMEG ..	Dingy to white .	3¼d a 4d
CINNAMON ...	Ordinary to fair sweet	4d a 1s 3d
CITRONELLE ..	Bright & good flavour	1s 1½d a 1s 2d
ORCHELLA WEED—		
Ceylon ..	Mid. to fine not woody	10s a 12s 6d
Zanzibar. ..	Picked clean flat leaf	10s a 15s
	,, wiry Mozambique	10s a 11s
PEPPER (Black)—		
Alleppee & Tellicherry	Fair to bold heavy	2¾d a 3d
Singapore	Fair	2 15-16d
Acheen & W. C. Penang	Dull to fine	2¾d a 2 11-16d
PLUMBAGO, lump ..	Fair to fine bright bold	15s a 17s 6d
	Middling to good small	3s 6d a 13s
chips .	Dull to fine bright	1s 6d a 8s 9d
dust ..	Ordinary to fine bright	2s a 6s
SAFFLOWER ...	Good to fine pinky ..	85s a 90s
	Middling to fair	80s
	Inferior and pickings	60s a 65s
SANDAL WOOD—		
Bombay Logs	Fair to fine flavour .	£29 10s a £50
Chips	... ..	5s a £3
Madras, Logs	Fair to good flavour ..	£30 a £50
Chips	Inferior to fine	£4 a £8
SAPAN WOOD, Bombay	Lean to good ..	£4 a £5
Madras	Good average ..	£4 a £5 nom.
Manila	Rough & rooty to good	£4 10s a £5 15s
Siam	bold smooth	£6 a £7
SEEDLAC ..	Ord. dusty to gd. soluble	70s a 80s
SENNA, Tinnevelly ..	Good to fine bold green	4d a 8d
	Fair middling medium	2¼d a 4½d
	Common dark and small	1d a 2d
SHELLS, M. o'PEARL—		
Bombay ..	Bold and A's ...	£4 15s a £5 5s
	D's and B's	£4 7s 6d a £5
	Small	£3 17s 6d a £4 5s
Mussel ..	Small to bold ..	21s a 57s 6d
TAMARINDS, Calcutta	Mid. to fine bl'k not stony	7s a 8s
Madras ...	Stony and inferior ..	4s a 6s
TORTOISESHELL—		
Zanzibar and Bombay	Small to bold dark mottle part heavy {	16s a 22s 6d
TURMERIC, Bengal	Fair	9s 6d
Madras	Finger fair to fine bold	13s a 15s
Do.	Mixed midlng. [bright	12s a 13s
Do.	Bulbs	8s a 9s
Cochin ..	Finger	10s
	Bulbs	6s 6d a 7s 6d
VANILLOES—		
Mauritius and } 1sts	Gd. crystallized 3½ a 9 in.	19s 6d a 33s
Bourbon ... } 2nds	Foxy & reddish 4½ a 8 ,,	17s a 22s
Seychelles 3rds	Lean and inferior ..	10s a 16s
VERMILION ..	Fine, pure, bright ...	2s 4½d
WAX, Japan, squares	Good white hard ...	39s a 40s

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for April :—

Vol. VIII.] APRIL, 1897. [No. 10.

SEASON REPORTS FOR FEBRUARY.

WESTERN PROVINCE.—Paddy. Maha harvest over, and preparations going on for Yala sowing. Fruits scarce, vegetable supply good except in Negombo district. Rainfall light. Maha crops good.

Central Province.—Paddy. Maha crop being harvested or nearing maturity, except in Uda Hewaheta and Walapane, where cultivation has just commenced. Prospects good except in Uda Bulatgama. Dry grain crops good or fair, but not satisfactory in Matale owing to damage by rain.

Northern Province.—Paddy. Kalapokam 1897 harvested, crop good in Mannar, somewhat damaged by rain in Jaffna and Mullaittivu. Cattle murrain still prevailing in Tunukkai.

Southern Province.—Paddy. Maha harvest on, and preparations going on for yala, crops fair. Fruits and vegetables scarce.

Eastern Province.—Paddy. Munmari crops harvested, outturn good except in some places where damage was done by floods of the previous months.

North-Western Province.—Paddy. Maha crop in various stages but harvested in many parts, yield and prospects generally good.

North-Central Province.—Paddy. Crop in various stages, but a good harvest is anticipated. A few occasional cases of murrain in Kalagam palata.

Province of Uva.—Paddy. Yala crop gathered, yield good. Cultivation for maha commenced. Fruits and vegetables plentiful and cheap. A few cases of cattle murrain in Kendagolla village.

Province of Sabaragamuwa.—Paddy. Maha harvest good both in the Ratnapura and Kegalle districts. Dry grain crops satisfactory except in Kadawata and Meda Korales owing to drought.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF MARCH, 1897.

1	Monday ..	Nil	19	Friday ..	Nil
2	Tuesday ..	Nil	20	Saturday ..	Nil
3	Wednesday ..	·04	21	Sunday ..	Nil
4	Thursday ..	·05	22	Monday ..	Nil
5	Friday ..	Nil	23	Tuesday ..	Nil
6	Saturday ..	·56	24	Wednesday ..	Nil
7	Sunday ..	Nil	25	Thursday ..	Nil
8	Monday ..	Nil	26	Friday ..	Nil
9	Tuesday ..	Nil	27	Saturday ..	Nil
10	Wednesday ..	·24	28	Sunday ..	·30
11	Thursday ..	·08	29	Monday ..	Nil
12	Friday ..	Nil	30	Tuesday ..	Nil
13	Saturday ..	Nil	31	Wednesday ..	Nil
14	Sunday ..	·53	1	Thursday ..	Nil
15	Monday ..	·55			
16	Tuesday ..	Nil		Total ..	2·35
17	Wednesday ..	Nil		Mean ..	·07
18	Thursday ..	Nil			

Greatest amount of rainfall in 24 hours on the 6th instant inches ·56.

Recorded by A. R. JEREMIAH.

GREEN MANURING AND MIXED CROPPING.

Mr. Ewart of Atchencoil, Shencotta, in writing to us says :—" It may interest you to know that Dadap loppings have been tried as green manure, and the result has been an increase of some 30 per cent in paddy." This is the *Erythrina lithosperma* used together with *E. indica* (erabadu) as shade for

cocoa in Ceylon plantations. We have heard of the foliage of the latter—a common native hedge plant—being used for green manure in parts of the Island, as well as the leaves of Keppitiya (*Croton lacciferum*), *Tephrosia tinctoria* (pila), *Callicarpa lanata* (illa) and other trees. In India, plants that contain a milky juice such as *Calotropis gigantea* (wara) and the milk hedge (*Euphorbia tirucalli*) are specially preferred by the ryot, but besides these various other plants are favourite manures. The following are among those which are most generally employed in India, or are supposed by the natives to have some special manurial value: *Adhatoda vasica* (Adatheda), *Calotropis gigantea* (wara), *Cassia auriculata* (Ranawara), species of *Datura*, *Dodonæa viscosa* (Eta werala), *Indigofera paucifolia*, *Jatropha curcas* (Rata endaru), *Melia azadriach*, *Mirabilis jalapa* (Sendrika), *Ocimum sanctum* (Maduru Tala), *Pongamia glabra* (magul karanda). In parts of India *Adhatoda vasica* is largely used as a vegetable manure for paddy-fields, and it is believed to possess the property of destroying low forms of aquatic vegetation as well as of protecting crops against insect attack. It would appear that a number of the so-called green leaf manures in use are selected for certain properties they possess which are inimical to insect life. Apart from their action as fertilizers, green crop manures are valuable agents in improving the mechanical condition of both clayey and sandy soils, and we believe that by a judicious selection of green crops and leaves, the village cultivator will be in aposition to materially improve his land and increase the yield of his crops. The reference to the result of green leaf manure with which this note opens only goes to prove this latter fact. In the light of our present knowledge of the mode of nutrition of leguminous crops, we would advisedly look for our green crop fertilizers among the members of this order of plants—to which erabadu, dadap, illa, pila, indigo, ranawara, and magul karunda (the plants already referred as being commonly used for the purpose) belong. So far the cultivator has had to base his choice on his own experience and that of previous generations. He will now be able to add to his list of green leaf manures by further additions from the leguminosæ.

In this connection we would make reference to the benefits of mixed cropping, not carried out in the slip-shod manner which we find our cultivators adopting in their chenas, but regularly and in order, as it should be. The Superintendent of the Poona Farm has been experimenting with Dhall (*Cajanus indicus*) as a nursing and foraging plant for cereal and fodder crops. It is advised that dhall should be planted four feet apart and the principal crop grown in rows between it. Dhall occupies the land about eight months; it has enormous root development and resists drought in a remarkable degree. Its long tap roots penetrate the soil and collect plant food there. All the leaves fall as the crop ripens, and these litter enriches the surface soil, while the roots enrich the soil with nitrogen got from the atmosphere. These characters place Dhall in the forefront as a rotation crop and as one of the plants that should be chosen for mixed cropping, particularly in cereal cultivation, whether for grain or fodder. The *Indian Agriculturist*, referring to the Poona experiments, truly remarks that leguminous crops of the papilionaceous suborder are the best to rotate with cereals, because through the influence of bacteria existing in the tubercles on the roots of these pulse crops, free nitrogen is taken from the atmosphere and converted into an organic compound of nitrogen. This combined or organic nitrogen becomes available as plant-food as the root residues of leguminous crops decay in the soil. "The growth of leguminous crops with cereals in rotation, or, as is more common in India, as a mixed crop", says our Indian contemporary, "has probably done more to raise the fertility of Indian soils than any other cause." It is a fact that many of the papilionaceæ are not only useful as rotation or mixed crops, but also provide excellent green fodder for milch or other cattle.

We believe that much good can be done by teaching cultivators how to make use of green leaf and crop manures, to the best advantage and persuade them to adopt an approved system of mixed cropping in their chenas, using such a fertilizing crop as dhall, which, at the same time, will add materially to the poor stock of food at the disposal of the villager in the remoter parts of the Island,

OCCASIONAL NOTES.

Mr. Menon, of the College of Agriculture, Saidapet, and at one time connected with the Colombo School of Agriculture, paid us a visit last month on his way back from England to India. Mr. Menon has been spending some two years at the principal agricultural centres in Great Britain and on the Continent, and has derived a deal of valuable experience thereby.

The students composing the new Forestry class are Messrs. Fontyn, Karunaratne, H. S. Dias, R. de Silva, L. Mendis and M. A. Fernando. The work of the class commenced on the 1st prox.

Preparations are in progress for a trial with imported varieties of Indian paddies. The ploughing which is now going on is being done with a light iron plough made locally.

The "Green Bank" dairy in Jail Rood which was started a month ago on a small scale is, we hear, being gradually extended. The increase in the number of better class dairies goes to prove that there is a rising demand for good milk in the city, and also that dairying if intelligently carried on is a remunerative industry.

DR. KOCH'S INVESTIGATIONS INTO THE CAUSE OF RINDERPEST.

INTRODUCTORY.

The Agricultural and Veterinary Journals are largely occupied with the subject of rinderpest which has been once again brought prominently into notice by the devastation that the plague has caused in South Africa. It will be remem-

bered that the Cape Government engaged the services of Dr. Koch, the eminent Berlin scientist, to study the plague on the spot with a view to discovering a preventative and cure for the disease. Dr. Koch established his laboratory and experimental station at Kimberley, and his two preliminary reports have already been published in full. With us, outbreaks of rinderpest are a common experience, and every year sees large numbers of cattle carried away, so that the position of the native cultivator becomes more or more difficult, and he is not merely left poorer by the loss of his stock, but also by the crippling of his resources in the cultivation of his land: for how often may not the remark of the Government Agent of the North-Central Province in the January Season Reports be repeated as to other parts of the Island: "The severe murrain of last year causes great scarcity of buffaloes for agricultural work"? And yet, what has been done in the way of dealing with the scourge? Where is the activity that should characterize the efforts to cope with the plague? Any enquiry into the possibility of discovering a preventative and cure for rinderpest is of such importance and so nearly concerns us, that we make no apology for surpressing a good deal of the matter that should have occupied the pages of the present number, and devoting a great part of this issue of the Magazine to the reports on the investigations referred to: and we have no doubt that most of our readers will be thankful for the information which we are able to afford them. It is said that the Royal Society has also taken up the enquiry, so that there will be no lack of talent among the scientific workers who will be associated in the search for a remedy for the plague. We must, however, not forget to give the credit that is due to those who have already done so much good work within the last few years in examining into the cause of rinderpest, viz., Dr. Edington, Veterinary Surgeon Hutcheon, and Dr. Simpson, the Health Officer of Calcutta. We should mention that we are indebted to the official Agricultural Journal of Cape Town for the text of Dr. Koch's reports.

DR. KOCH'S FIRST REPORT.

Dr. Koch's first report, dated Kimberley, December 9th, 1896, is of a preliminary character and does not deal with his own investigations. He states there that he put himself in communication with Doctors Turner and Edington and Veterinary Surgeon Hutcheon, and refers to his visit to the research station of Dr. Edington situated at Taungs. The following is his description of his experience in his own words:—

"Having arrived there on the morning of the 6th (December 1896), I visited the laboratory and saw the arrangements made, its experimental animals, prepared specimens and cultivations. Of the animals, one had died during the night of 5th to 6th, according to Dr. Edington's statement 23 days after having contracted rinderpest, and two more were sick. The autopsy which was made soon afterwards by Mr. Robertson showed that it had succumbed most probably to a secondary infection, starting in the tonsils.

A short time after this *post-mortem* examination was finished, at 12-30 p.m., one of the two animals that were sick died. This one was also immediately dissected by Mr. Robertson. This examination revealed the characteristic lesions of rinderpest in a comparatively early stage. Of both these animals dissected blood, mucus, and pieces of the internal organs were collected and preserved, partly moist and partly dry. In the afternoon we inspected five head of cattle, which in the meantime were brought from Kafir kraals lying westward from the railway-station at Taungs. One of these appeared to be recently attacked. After having purchased the same we withdrew from its left jugular vein a fair amount of blood for experimental purposes.

On the 7th inst. I drove with my companions to the town of Taungs, where I was told I would find a large number of diseased cattle. However, I did not see one beast in the town, as all the cattle were driven by the inhabitants into the mountains. Government Veterinary Surgeon Soga informed me that the people living in Taungs had lost already 20,000 head of cattle from the pest, and thought to save the remainder best by driving them far away. I consequently returned at once to Dr. Edington's experimental station. The animal which we had brought the day before was then killed and dissected. The organs showed the characteristic appearances of rinderpest. From this animal material for examination and infective purposes was likewise taken. After having seen some more cases in an advanced state of rinderpest, and having obtained mucus from a newly-diseased animal, I returned during the night from the 7th to the 8th to Kimberley, accompanied by Drs. Turner and Kohlstock, and Mr. Henning.

Twenty head of cattle, twenty sheep, and twenty goats were in the meantime purchased. Of this number eight head of cattle were infected with the material brought from Taungs in such a manner that small sponges soaked in infected liquid were put into the nostrils, and then also the muzzle was painted over with the same sponge. To watch the animals and to superintend the persons employed in connection with the animals, Mr. Henning remained in the compound, and will continue to stay there for the time being.

From what I have seen till now of the cattle plague in the Cape Colony, I have no hesitation to say that the disease is the genuine rinderpest. With reference to the micro-organisms found and cultivated by Dr. Edington, I could hitherto not arrive at any definite conclusion. The infection trials performed with these cultivations appear to me not demonstrative, and I must consequently reserve my opinion concerning them until I have personally carried out experiments with them."

DR. KOCH'S SECOND REPORT.

The 2nd report, dated Kimberly, January 3rd, 1897, after detailing the arrangements made for laboratory work and microscopical examination, proceeds:

"Of the small experimental animals, sheep and goats are sheltered underneath the verandah along the stables, and two dogs are tied to poles underneath the verandah along the rear wall of the house. Birds, rabbits, mice, guinea pigs and pigs are housed in cages standing partly alongside the stable walls, and partly in open sheds. In the latter is also fastened a donkey and a mule, of which the former is only used for ex-

periments, while the latter serves at the same time for drawing the trucks and the trolley, upon which the dung and the carcases of animals are carried away."

The report here goes on to indicate the precautionary measures enforced to keep all animals which have recovered from rinderpest quite apart from those to be operated on and those which are being experimented with, so as to avoid the possibility of spontaneous infection. The method of work in taking temperatures and other details are carried out in such a way that "we consider any chance of transferring the pest impossible."

On the 22nd December Dr. Koch visited Tafel Kop Farm, in the Orange Free State, where he saw 23 out of a herd of 120 animals in various stages of rinderpest. From the diseased animals he gathered mucus which was dripping from the nose and mouth, and also some bile and blood from two which were previously slaughtered. In addition to this, specimens of organs were collected for microscopical examination and inoculation purposes.

On the 29th another visit was paid to two farms, at one of which 33 out of a herd of 66 had already succumbed, and at another where 40 out of a head of 140 had been carried of. At both places the living cattle showed in various stages of the disease. From a beast which had shortly before expired, specimens of blood were taken for examination. "Besides the materials for scientific research, both these visits afforded an interesting study of the nature, manner of spreading, and course of rinderpest."

"Our inoculation experiments performed hitherto had so far chiefly the object in view to discover an efficient method of transmitting the scourage of healthy animals, as the modes formerly in vogue cannot be considered satisfactory in this respect. They consisted in rubbing into the nostrils or bringing into the subcutis by means of setoning needles excretions from the diseased animal's body, such as slime running from the nose, the watery discharges from the eyes, and even evacuations from the intestinal canal. In doing so, the result was either uncertain in its consequences or the disease was from the start complicated with sepsis through being introduced into the system septic matter. The correctness of this assumption was also corrobo ated in my own experiments. As mentioned already in my previous report, we at first put the infective material in the nose and upon the mucus mmebrane of the mouth. The effect of this was that of eight animals treated in this way with material from Taungs, only one, that afterwards became the starting point for a whole series of experiments, contracted the disease. Of the second batch of animals, three in number, infected with slime from Tafel Kop, likewise only one took the pest. Taking into consideration the experience gathered in former epidemic outbreaks of rinderpest, it occurred to me that a *modus operandi* superior in every respect would be to inject blood hypodermically. For when blood is taken during the earlier stages of rinderpest, it does not contain any sceptic matter, but simply the contagion of rinderpest. This supposition has as yet shown itself perfectly justifiable. We have inoculated in the dewlap five animals with defibrinated blood, and they contracted the disease without exception after a period of incubation lasting from three to five days. Four of these animals have already succumbed, showing at the autopsy all appearances of rinderpest. One of them recovered after having been very ill, and will be utilised for immunisation experiments.

I purpose in making such successive injections of blood from one animal to another to get a series of infections, which will always supply me with fresh materials for examination. We think it best to have two such series, viz., one with material from Taungs, and another one with such brought from Tafel Kop. To make these experiments not too expensive we shall in each series only infect one animal at a time.

Experiments were also made with bile, which was taken from animals that had succumbed to rinderpest, and which we injected in the subcutaneous tissue. The motive for so doing was because a mixture of bile with blood or other liquids was said to be sometimes used by Free State farmers, and also the circumstance that in the bile of most of the cases examined I have found in pure cultivation a bacterium, which according to the description published is comformable with the microbe discovered by Dr. Simpson in Calcutta, and declared to be the cause of rinderpest. All these experiments with bile, however, had negative results.

We are consequently justified in saying that bile does not contain the contagion of rinderpest, and that Simpson's bacteria cannot be considered to be the microbe of rinderpest. All efforts to find by means of the microscope, as well as through cultivation, a specific micro-organism in the blood, have as yet proved fruitless. I also did not succeed in finding any specific micro-organism amongst the microbes which the mucus from the nose, the secretions from other mucus membranes, and the contents of the intestines naturally contain in large numbers. My examinations having the discovery of the origin of rinderpest in view, will naturally be continued, but the gre test stress must be put upon finding a process by which we are able so to attenuate the virus of rinderpest that we may use it as a preventive. With this object in view, we have inoculated other animals less susceptible to rinderpest, first of all sheep and goats. This was done on the 11th December when one Cape sheep, one Merino sheep, one Angora, and one Cape goat were inoculated with rinderpest blood. These animals did not show any marked symptoms afterwards, but they all suffered after a period of incubation extending two or three days from a rise of temperature identical with that of rinderpest. A second inoculation made on the 7th December with one goat, one Angora, one Merino, and one Cape sheep, had the same effect. Having thus proved that by injecting rinderpest blood a sort of mitigated rinderpest can be produced in the animals mentioned, we infected in second generation on the 24th of December two more goats, Angoras, Merinos, and Cape sheep. The rise of temperature seen also in these animals demonstrates that it is possible to propagate this attenuated rinderpest within the system of sheep and goats. After one or two further generations I shall try to re-transfer this attenuated rinder-

pest contagion to healthy cattle. Similar experiments we are just making, or intend soon to carry out, on antelopes, pigs, asses, mules and dogs.

I further propose to study the susceptibility for rinderpest of as many animals as possible that are suspected in this country to contract the disease or to assist in spreading it. I would in this respect recommend that camels also should be procured, in order to definitely decide upon their immunity against rinderpest or otherwise. Apart from all this, we shall further try if by some other means, viz., through chemical or physical influences, rinderpest blood cannot be rendered useful for preventive measures, that is to say, may be turned into a vaccine.

An opportunity to test carefully the remedies and modes of inoculation in vogue in South Africa against the disease has not yet offered itself, but I shall after a time inoculate with a virulent material those animals which were first treated with bile, in order to see if rinderpest bile has any protective properties or not.

On one of our visits to the Free State I observed that all animals on the farm were inoculated as a preventive with garlic or "knoflook" into the dewlap, but this procedure had evidently no beneficial result. On another farm the owner had drenched his cattle with a mixture of carbolic and petroleum, but this likewise proved futile.

On the other hand, however, every one who had the opportunity of becoming acquainted with the state of affairs along the Free State border in the district of Kimberley, will not hesitate in asserting that the restrictions enforced along this line have fulfilled their purpose. On one side of the boundary there have been for weeks several farms badly visited by rinderpest, and yet the Colonial one is still entirely free from the scourge.

With reference to the rinderpest microbe found by Dr. Edington, I beg to report to you that Dr. Edington has handed to me on the 28th ultimo a cultivation grown in bouillon, from which he inoculated in my presence two test tubes containing the same medium. Having convinced myself that the culture had been growing in the latter pure and opulent, I inoculated on the 31st ultimo with either of these cultivations one healty beast, and shall report to you in due time what effect this operation had upon these animals.

I would further like to direct your attention to the circumstance that one of the three animals, the autopsy of which was made in Taungs, was suffering from Texas fever, as we found on the next day when examining the blood. In order to avoid, when making such experiments, any errors that could happen though the disease being combined with Texas fever, we make it a point to examine microscopically the blood of all animals which we use for infective purposes. Potter.

Concerning our South African rinderpest, we have noticed that the symptoms in some respects differ somewhat from the descriptions given by other observers. We have, for instance, found that the escanthema and diphtheritic-like changes on the mucus membrane of the mouth and on the palate are but little marked, whilst the early pathological lesions in the intestines are rather considerable. Thus we have seen thrice amongst ten *post-mortem* examinations fibinous bloody excretions of the walls of the intestinal tube. The latter has produced coherent masses about a yard long, which formed a sausage-like complete cast of the walls of the intestines, and surrounded a small canal filled with excrement of a thin fluid nature. The masses mentioned consisted of detached epithelium of the digestive tract, a firm fibrine-like substance and blood.

What may be the reason of this difference, whether climatic influence or the peculiar breed of cattle, I am at present unable to decide. In all other points, however, the symptoms of the disease do so completely agree with the genuine rinderpest that their identity cannot be doubted.

The observations made during the last English epidemic by Burdon-Sanderson, viz., that the beginning of the pest can be recognised by an elevation of temperature several days before other symptoms are manifest, we could confirm in every single case that came under our notice at the Experimental Station. This is a fact of utmost importance not only for experimental research but also for practice, as thus the advent of the disease can be detected already at such a time when no infectious discharges are evacuated and the animal is not yet able to spread the pest."

ARECANUT CULTIVATION IN INDIA.

(*Continued.*)

In Thana.—The betel-nut is grown largely in Thana, Bombay. The best nuts are carefully selected in October and dried in the sun; unhusked nuts are considered best for seed. They are planted in a well-ploughed plot of land in pits three inches wide and three inches deep, and at a distance apart of from six inches to a foot. For the first three months the young palm is watered at least every fourth day and afterwards every third day. When the plants are a year or a year and a half old they are fit for planting out. The selling price of young plants varies from 6 pies to 1 anna.

The betel palm usually grows in red soil, but it flourishes best in sandy soil that remains moist for some time after the rains. Before planting the young palm, the ground is ploughed, levelled, and weeded, and a water channel is dug six inches deep and a foot and a half wide. Then pits nine inches deep and two feet wide are dug at least four feet apart, nearly full of earth, but not quite full, so that water may lie in them where the soil allows; plantains are grown in the beds to shade the young palms. Except during the rainy season, when water is not wanted, the young trees are watered every second day for the first five years and after that every third or fourth day. During the rains manure is sometimes given.

The cost of betel-nut cultivation in Thana is calculated as follows: An acre entirely given to betel palms would, it is estimated, hold 1,000 trees. The total cost of rearing 1,000 betel palms for five years—that is, until they begin to yield—is about £127 13s., including compound interest at 9 per cent. After 5 years a thousand trees are estimated to yield about £50 a year, from which, after taking £18 4s. for watering assessment and wages and £11 9s. 11½d. as interest at the rate of 9 per cent. on £127 13s., there remains a net estimated profit of £19 16s. 3½d. or 15·52 per cent.

In Bengal.—The supari or betel-nut is common in Eastern Bengal, especially in Tipperah, Backergunge, and Dacca; and its cultivation is very profitable to proprietors of land. It bears fruit in the eighth year, and is most productive from that time to the sixteenth year, when the produce falls off. The nuts are gathered in November.

Betel-nut cultivation is very extensive, especially in the Police circles of Tubkibagara and Hajiganj. A considerable trade in this article is carried on with Dacca, Naraingauj, and Calcutta. The cultivators of the palm usually own a large piece of ground, slightly raised above the level of the surrounding country, and surrounded by ditches. In the centre of this they build their dwellings, and all round then they plant betel-nut trees. An acre of land will obtain about 3,000 trees. When first planted the betel-nut requires to be protected from the sun; for this purpose rows of madar trees are planted between the lines of betel-nut trees, and the growth of jungle is encouraged. When the betel-nut trees have grown strong, and no longer require the shade, the cultivators are too lazy and thoughtless to remove the jungle; and the result is that whole parganas which were once fully cultivated are now covered with dense jungle, in which even the betel-nut trees cannot grow; while thousands of the inhabitants have been swept away by cholera and malarious fever of a very virulent type. The unhealthiness of the neighbourhood of betel-nut plantations is variously attributed to the dense jungle and undergrowth above-mentioned, to the exhalations from the trees, and to the malarious gases generated by decomposing vegetable matter in the ditches surrounding the plantations. The betel-nut trees grow to a height of about 60 feet; and in some parganas they are cultivated to such an extent as to almost entirely exclude rice cultivation.

THE RELATION OF MODERN SCIENCE TO AGRICULTURE.

This is the subject of a brilliant address delivered at the University of Aberdeen by Professor Hendrick. The professor, says an English exchange, "clearly set forth the ground on which he stands as a teacher of science related to agriculture, and no one can possibly disagree with the claims urged on behalf of scientific teaching. He has not claimed too much, nor yet has he claimed too little." The address, which has been fully reported, is far too long to be quoted in our limited columns, but we cannot forbear making copious extracts from it, in the hope that it might bring conviction, as regards the importance and usefulness of modern agricultural teaching, to the minds of the conservative and sceptical who are always ready to sneer at technical education in agriculture and to cripple its power for good.

Professor Hendrick's opening remarks were as follows:—

"In coming for the first time publicly before an Aberdeen audience, and as—I think I am right in saying—the first lecturer in agricultural chemistry in this ancient university, it seemed to me that there are many subjects on which I might address you. But when I reflected that there are, unfortunately, still in our country those—and they are not confined to agriculture—who look upon science as essentially opposed to practice and on what is scientific, and as it is often sneeringly called *theoretical*, as by its very nature opposed to what is practical, it seemed to me that I could not do better than come forward at once and treat the general question of the relations of modern science to agriculture. This university, in common with most of the universities and university colleges of Britain, has recently made a new departure in organising in her faculty of science a department of agriculture. All over the country we have been hearing a cry, voiced with greater or less wisdom and enlightenment, for agricultural teaching of all grades—from that of elementary schools to that of universities. I hope to show you, if you will bear with me so long, that there is only too good justification for this cry, and that our universities and colleges are not a moment too soon in responding to it. Indeed, I may at the very outset state to you my main contention. Science has in this nineteenth century already revolutionised agriculture, and brought about an unprecedented state of affairs for that most ancient industry. And I maintain that it is not only important, but of fundamental importance, that the rising generation in agriculture who are going forward to face the twentieth century should be equipped with all the weapons which our science, which our modern knowledge can give them. I also maintain that it is our duty to raise up a body of trained agricultural investigators to extend and improve our knowledge, and to provide a suitable field and means of inquiry for these.

It is not my place to deal with economic questions relating to the altered state of agriculture. I am not here to deal with systems of land tenure or their improvement, with land banks and improved systems of agricultural credit, with improvements in carrying and marketing systems, or with any of the other instruments for adjusting ourselves to altered conditions brought about and rendered possible by the advance of knowledge. But below all these, of greater and more fundamental importance than any of them, is the advance of that knowledge, the increase and spread of that science, which has not only altered all the relations of agriculture, but has revolutionised all industry, and, indeed, changed the whole outward appearance of modern society. With this it is my duty to deal. If, gentlemen, I had the presumption on this my first appearance before you to preach you a sermon, ancient wisdom would readily supply me with a text. I might preach to modern agriculture what Solomon preached long ago:—"There is gold and a multitude of rubies; but the lips of knowledge are a precious jewel.

Some three or four centuries ago philosophers began to leave the medieval method of basing all their knowledge on ancient authority, and boldly set out to examine and question Nature for themselves. For long most of the knowledge gained was what the practical man would call useless. Fortunately, however, when very little so-called practical results were gained, there were always men with sufficient enthusiasm to pursue knowledge for its own sake. So, through long years,

knowledge was added to knowledge, and theory to theory, till modern science, which had been slowly growing for two centuries, burst into full bloom, and that fruit-bearing from which we are profiting in this century was made possible. We know more than our ancestors, and ancient wisdom tells us that it is the part of the wise man, and, I may add, of the wise nation, to increase knowledge and understanding."

* * * *

"I have roughly sketched, then, the altered conditions in which the progress of the world has placed agriculture. The new conditions require, of course, new methods. It is useless to fight a modern army with spears and bows, no matter how skilful we may be."

* * * *

"Science has armed the farmer with weapons of precision which place him as much ahead of his predecessors as the soldier of today is in his equipment ahead of the soldier of Waterloo.

It is not enough to put in the hands of a body, even of the most able and intelligent men, modern weapons to make them a modern army.

They must have organized training in the principles of their use. They must be organised and drilled, and beyond them there must be specialists who are constantly active in increasing all knowledge which can add to the effectiveness of their methods of offence and defence. So it is in the army of our agricultural industry. We are in the midst of a great struggle. In the twentieth century they will command the market who are not only good men with good weapons, but who are well educated and well organised, and who have a good scientific staff behind them to constantly improve their knowledge and their weapons. We cannot yet set any limit to the fierce competition for our markets, because we cannot yet set any limit to the development of new countries, to the development of improved machinery and methods, and to the development of the carrying industries of the world."

Professor Hendrick then went on to refer to Technical Education, and what the various Governments are doing in equipping the people from the armoury of science, and in promoting and increasing that purely theoretical knowledge which supplies the raw material to make new weapons ; a work in which every country which claims modern civilization—from Germany to Japan and round the world home again by way of the United States and Canada—is engaged, by organizing the education of the agriculturist.

He proceeds next to refer to the cry for something which is 'practical,' and remarks "but I am not quite sure that what we call practical does not very often consist in making the roof before we have laid the foundations."

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"The demand is all for something practical, which the practical man can understand. That means for the demonstration and development of principles already so well established that they are fit to be brought into relation with practical life. This is extremely useful work, and you will mistake my meaning if you suppose I am questioning its usefulness. But it is not the highest work. Really new knowledge cannot, on account of its very newness, be known to, or, in most cases, appreciated by, those engaged in practical life until it has been so established and its relations with other knowledge so determined that it is fit to be brought into relations with practical life. This always means the work of years, often of a lifetime. Still, such knowledge is the very source and mainspring of advance. It is the highest kind of knowledge. It is the knowledge which research stations and our highest teaching institutions, our universities, ought to increase and spread. It is the foundation on which our whole system of technical education should rest. This is accepted as past the need of demonstration in Germany and France. Tyndal preached it eloquently in America a quarter of a century ago. America has been acting on his advice."

"Gentlemen, I fear I am risking your displeasure in speaking in this way before practical men, but I have almost got to hate the very words 'technical and practical education,' on account of the utterly wrong idea so often bound up in them in this country. By all means let us have technical education—let us have agricultural education ; but let them be really practical. Let them begin by teaching principles and theories on which the practice rests, and leave alone that which can be better trained in practice to practice. 'What is the use of chemistry ?' says the practical man. 'I have no time to waste with that. I want something practical.' So we constantly get students who want to come directly to learn agricultural chemistry before they have learned anything of the principles of chemistry itself. They want to learn the applications of a science before they have mastered its elements. I am not here to teach practical agriculture, but I am here to teach the principles, the theories as applied to agriculture of one of the sciences which lie at the foundation of agriculture and of all industry. The difference between the new and the old education is not that, whereas a boy once learnt agriculture on a farm, now he will learn it in a school or college. Not at all ! Modern conditions require that we should arm our agriculturists, and especially those who occupy any position of leading in agriculture, with knowledge of the scientific principles which underlie their art, but that does not excuse them from the necessity of learning their art even as their forefathers did. There is something added on. Modern conditions give a man a greater productive power, but they also demand of him a greater training. Education cannot make a practical man, and knowledge cannot make a wise man. But, to the practical man and to the wise man knowledge of principles and the trained mind are an inestimable advantage."

"I am afraid the mere use of the words science and scientific produces a prejudice in many minds against those things in connection with which they are used. Still more dreadful is it to use those awful words theory and theoretical, which are supposed to denote the very opposite of what is good and useful. It is very unfortunate that, like so many words, these words have various meanings which, though connected with one another, express very different things. The words science and scientific I need not defend. Though there is much science, falsely so-called, science

means merely exact knowledge—knowledge reduced to a system. But what have I to say for theory? Well, what is a theory? The word, unfortunately, has a loose and degraded meaning—a bad meaning—as well as the strict and good meaning in which it is used in science. In its bad meaning, which is not very definite, but has various shades of badness, it stands for a useless or groundless speculation which leads nowhere, and which is not tested by facts or practice. But that it not the sense in which we use it in science. I am inclined to think in this sense the non-scientific man is a greater theorist than the scientific. This is the very antithesis ôf what is scientific. The very first lesson of science is never to theorise in this sense.

So soon as we have accumulated a mass of facts in any branch of knowledge, the mind naturally seeks an explanation of them. It seeks to group them together, to systematise them by some great common circumstance or cause which produces them. In fact, it forms a theory. It may be a wrong theory, but at least it is based on facts, which it attempts to explain.

But all the history of science shows that a wrong theory is often an approximation to the truth, or contains some germs of truth in it. A scientific theory, then, must not only be an explanation of fact, but it must not be inconsistent with any known fact. It must be able to fit in with and explain everything known which is connected with it. If it does not, it must be modified or rejected. Scientific theory is therefore a most useful thing. It is a most practical thing. Not only does the clashing of rival theories when we are at the stage before we have arrived at an accepted theory—always lead to investigation and inquiry on the part of their advocates, each anxious to discover everything which can favour his point of view and hence lead to great extension of knowledge, but when we have arrived at a correct theory we are placed in a position of great advantage. We now have an explanation of certain facts of Nature. Hence we are so far in a position to use and control Nature for our benefit, because we now understand her working. But further, and still more important, we never arrive at a true theory without it leading to developments, often in the most unexpected directions. We can never arrive at the explanation of any one set of facts without it throwing light on a host of others. There is no department of natural study so small and mean that the acquisition of a true theory regarding it will not improve the outlook of all human knowledge. Some of you may know how beautifully Tennyson put this thought in the poetical words:—"Flower in the crannied wall, I pluck you out of the crannies; I hold you here, root and all, in my hand, little flower—but if I could understand what you are, root and all, and all in all, I should know what God and man is." We see, then, that a real theory is the most practical of things. It grows from facts; it explains facts; it increases known facts; it never loses its hold on facts. I am not ashamed to proclaim myself a teacher of theory."

In concluding his able address Professor Hendrick said:—

"Now, gentlemen, I must not try your patience any longer, but endeavour to come to a close. But just let me ask—What is the use of this agricultural department? This is for you to determine. I have endeavoured to the best of my ability to point out to you the crying need there is to bring our highest training and research, which, I presume, should be found in our universities, into touch with our industries. In this district, as in many others even in our manufacing and commercial Britain, agriculture is the great industry. It should be the duty of this department, then, to form a centre of scientific knowledge and a centre for the dissemination of such knowledge in the agriculture of the district. We cannot do this without your sympathy and support. Our modern agriculture needs to have scientific specialists placed at her disposal, brought into the closest possible relations with her, not merely as analysts and commercial scientists, but as teachers and advisers, centres for the creation and spread of knowledge. The modern agriculturist, be he landlord, factor, farmer, or be he a manure merchant or manufacturer, or other follower of a business depending on agriculture, needs to know a great deal of the sciences connected with agriculture. Therefore, he needs to be taught. From these classes, therefore, and from the teachers who are to carry the information on to other grades of society, we ought to draw students. If we do not, we are not doing our duty, or you are not using your privileges. Already in Germany no man need apply for any agricultural post of importance who has not a college training in the sciences, as well as a field training in the practice of agriculture. Are we going to fall further behind? It is an ignoble thing to be spurred on merely by fear of the foreigner; but, if you will not move from higher motives, let that move you. Then, even when our men are taught, they cannot know everything. They cannot become encyclopædias, carrying all the information of all the specialists who have taught them. Therefore we need means, such as are supplied by the universities and research stations abroad, to bring our specialists and their knowledge freely to the use of agriculture. We are here to be used. No, gentlemen, the world has changed, and we must change with it or be crushed out. If the days are gone when we can get 5 per cent., we must be content with 2½. If the days are gone when it was enough to take pains with our hands and our feet, we must take pains with our heads as well. We must call to our aid that force which has changed the world or it will destroy us. I appeal to the twentieth century for my justification."

INSECT PESTS.

[*Being selections from the Report of the Government Entomologist, Cape Town.*]

In an entirely normal state of nature, the relations between plant-feeding insects and their enemies remain practically the same during a series of years. These enemies are predaceous animals, such as snakes, toads and birds, and predaceous and parasitic insects. The first class, that is the predaceous animals, and a part of the second feed with little discrimination on a great variety of insects, and hence their influence on a particu-

lar species is largely in direct relation to that insect's abundance. Most of the enemies of the second class, however, confine their attention to one species or to a few closely-allied species, and hence the abundance of a particular species of insect is greatly influenced by the abundance of these enemies. For a few years these enemies may keep an injurious insect in an almost complete state of subjection ; but, becoming over numerous, they perish for want of food, and the injurious insect is left to multiply in peace, which it quickly does. But its climax is soon reached, for the few enemies peculiar to the species which have survived the famine again find the land abounding in plenty, and, responding to the conditions, they in turn multiply and soon again subject the plant-feeder. Thus in a series of years, in spite of the marvellous fecundity with which Nature has provided insects, their numbers remain approximately the same. The limits in time of this " rise and fall" varies widely with respect to different insects. With some, as with many aphides, only a single season is required ; with others, as with many locusts, several years are required. But always Nature tends to preserve a balance, and under strictly natural conditions no insect long remains superabundant.

Man, however, upsets these fine adjustments of Nature. He devotes immense areas of territory to the same food-stuff, he cultivates the plants, rendering them more luxuriant. more tender and succulent. Thus the favours the plant-feeding insect. Nature had designed it to meet with privations, for less nourishing food and less bountiful provision. Under its new conditions the insect simply luxuriates. To effect its perpetuation it had been endowed with wonderful powers of multiplication, and these are now used to their fullest extent. Food is now plenty ; there is room for their increase. Many birds and other small animals are not tolerated by the farmer among his crops, and thus no small degree of the check which Nature had provided to prevent an undue superabundance of the plant-feeding insect is removed. The parasitic and predaceous insect enemies remain, it is true, but these alone can wage only an unequal war, with the balance always much in favour of the plant-feeder. For these reasons the farmer must wage eternal war against plant-feeding insects.

Comparatively few persons realize what an immense variety of forms is displayed in insect life. To the average Colonial farmer there are a few species of locusts, a few different kinds of caterpillars, some flies, a dozen or so " bugs" and perhaps as many beetles. Knowing so few insects, he fails to appreciate the difficulties in the study of entomology, and why, with all the entomologists, so little can often be told him regarding a particular insect.

In number of species, insects far out-number all other classes of animals combined. Dr. C. V, Riley, late entomologist to the United States Department of Agriculture, published the statement in 1892 that *ten millions* would in his judgment be a moderate estimate of the number of different species of insects ! The vast majority of these remain undescribed and unnamed. In the United States about twenty-five thousand species have been named and described, and of these Dr. J. A. Lintner, the New York State Entomologist, estimates that at least fifteen thousand are injurious, and that about half of this number, or between seven and eight thousand, may justly be regarded as pests.

(*To be Continued.*)

REMEDIAL VALUE OF VEGETABLES AND FRUIT.

Asparagus is used to induce perspiration.

Apples are useful in nervous dyspepsia ; they are nutritious, medicinal, and vitalizing ; they aid digestion, clear the voice, correct the acidity of the stomach, are valuable in rheumatism, insomnia, and liver troubles. An apple contains as much nutriment as a potato, in a pleasanter and more wholesome form.

Bananas are useful as a food for those suffering from chronic diarrhœa.

Blackberries as a tonic. Useful in all forms of diarrhœa.

Cranberries for erysipelas are used externally as well as internally.

Carrots for sufferers from asthma.

Celery is valuable as a food for those suffering from any form of rheumatism, for diseases of the nerves, and nervous dyspepsia.

Figs are aperient and wholesome. They are said to be valuable as a food for those suffering from cancer ; they are used externally as well as internally.

Fresh ripe fruits are excellent for purifying the blood and toning up the system. As specific remedies, oranges are aperient. Sour oranges are highly recommended for rheumatism.

Grapes dilute thick blood, send the circulation to the surface, remove obstructions from liver and lungs, and bring the stomach to a healthy condition.

Lemons for feverish thirst in sickness, for biliousness, low fevers, rheumatism, colds, coughs, liver complaint, etc.

Lettuce is useful to those suffering from insomnia.

Onions are almost the best nervine known. No medicine is so useful in cases of nervous prostration, and there is nothing else that will so quickly relieve and tone up a worn-out system. Onions are useful in all cases of coughs, colds, and influenza ; in consumption, insomnia, hydra phobia, scurvy, gravel, and kindred liver complaints. Eaten every other day they soon have a clearing and whitening effect on the complexion.

Pineapple juice will cut the membrane from the throat of a diptheria patient when nothing else will.

Peanuts for indigestion ; they are especially recommended for corpulent diabetes. Peanuts are made into a wholesome and nutritious soup, are browned and used as coffee, are eaten as a relish, simply baked, or are prepared and served as salted almonds.

Pie plant is wholesome and aperient, is excellent for rheumatic sufferers. and useful for purifying the blood.

Spinach is useful to those suffering with gravel.

Turnips for nervous disorders and for scurvy.

Tomatoes are a powerful aperient for the liver, a sovereign remedy for dyspepsia and indigestion

Watercress is a remedy for scurvy.

Watermelon for epilepsy and for yellow fever.

GENERAL ITEMS.

A correspondent to the *Scottish Farmer* referring to ticks, says:—Having had considerable experience with ticks in South Africa, I may say that I never found them injure much healthy fat cattle. Principal Williams recommends tar and linseed oil. I have found lard and flowers of sulphur superior to anything else.

There is great rejoicing in Denmark by Dr. Bang's discovery of the bacterium which causes abortion. It remains now to discover the best way of destroying the germ, but meanwhile it has been demonstrated that a bull used for service on a cow that has aborted may infect any cow he serves afterwards.

In New Zealand the aeration of milk is made compulsory by law. Every supplier of milk has to pass his milk through an aerator, or, at all events, remove the animal odour from it immediately it is drawn from the cow. The "refrigerator" which also aerates milk is too expensive for common use, but now more than one cheap aerators has been patented. The latest on the market is the "Austral," which is said to be very satisfactory and cost only 12s. 6d.

The latest device for preserving eggs is to rub them over with the white of egg and pack in flour. By this method both the yolk and whites are said to remain marvellously fresh and sweet.